

# AMERICAN JOURNAL OF ORTHODONTICS

OFFICIAL PUBLICATION OF  
THE AMERICAN ASSOCIATION OF ORTHODONTISTS,  
ITS COMPONENT SOCIETIES, AND  
THE AMERICAN BOARD OF ORTHODONTICS

## *Editor-in-Chief*

H. C. POLLOCK, ST. LOUIS, MO.

## *Assistant Editor*

EARL E. SHEPARD, ST. LOUIS, MO.

## *Editor of Abstracts and Reviews*

J. A. SALZMANN, NEW YORK, N. Y.

## *Sectional Editors*

CHARLES R. BAKER, Evanston, Ill.

HENRY D. COSSITT, Toledo, Ohio

JOSEPH D. EBY, New York, N. Y.

WILLIAM E. FLESHER, Oklahoma City, Okla.

HENRY F. HOFFMAN, Boulder, Colo.

RAYMOND C. SHERIDAN, South Orange, N. J.

JAMES D. McCOY, Beverly Hills, Calif.

OREN A. OLIVER, Nashville, Tenn.

PUBLISHED BY THE C. V. MOSBY COMPANY, ST. LOUIS 3, U. S. A.

TABLE OF CONTENTS ON PAGE 2

Copyright © 1958 by The C. V. Mosby Company

# Lok-tite LOCKS TIGHT

*"Lok-tite"*  
**WILLIAMS** *Lok-tite* **LOCKWIRE**  
Means what it says . . .

Williams "Lok-Tite" Wire does lock tightly and it unlocks just as easily. This is because "Lok-Tite" is Williams engineered with a high bend test rating to give long serviceability. It is a quality gold product, readily soldered, easily contoured and non-tarnishing.

Williams "Lok-Tite" Lock Wire is available in .028 and .030 gauges in 12" lengths. If you are one of the few orthodontists who has not used "Lok-Tite", don't delay in availing yourself of the opportunity and service which "Lok-Tite" can offer you. Order a 12" length today.



Free: "Aids To Your Orthodontic Technique"

Write Dept. 11

**WILLIAMS** *Gold Refining Co., INC.*

FORT ERIE N. ONT.

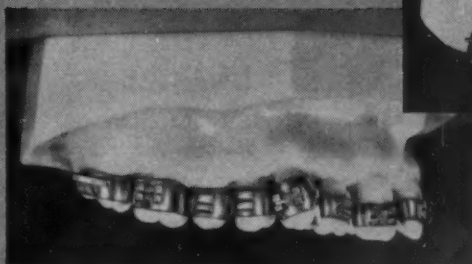
BUFFALO 14, N. Y.

HAVANA, CUBA





## FOR THE "EDGEWISE" MEN...



*Baker Siamese Triple-width Divided brackets are becoming extremely popular for rotations. These are supplied without solder to allow bending as required.*







Baker Brackets cost a few cents more but they're made of Orthoclast Wire Alloy . . . 100% precious metal. You get most of the difference back in scrap value.

1. They cannot be melted with your soldering torch. (Melt at 2379° F.)
2. They do not oxidize on heating—stay clean and bright in the mouth.
3. Milled to precision and tested to fit. .022 x .028 wires perfectly, without burs.
4. Brinell Hardness 229. Do not stretch or wear like non-precious brackets.
5. Each bracket has a sheet of proper amount of solder. You merely flux, place and heat.

Baker Brackets are also supplied mounted on strips of pure platinum surface precious metal Oralium Band Material or on four sizes Platinaloy Johnson Pinch Bands. State size and gauge when ordering. Double width Molar or Rotating Brackets are supplied with or without solder.

The Slide Pin Edgewise Brackets or Attachments, eliminating ligatures are being used extensively for full mouth assemblages. They are also used in combination with other brackets and in some cases on cuspids only with a loose tube and hook in front of them for closing spaces with elastics. Supplied mounted on strip bands, sizes as listed in price list, four sizes Johnson Pinch Bands or loose.

*Write For Complete Orthodontic Catalogue and Price List*

 <b>DOUBLE WIDTH MOLAR BRACKET</b>	 <b>SIAMESE OR TRIPLE WIDTH DIVIDED</b>	<b>CUSPID BAND AND BRACKET</b> 
<b>ON ORALIUM OR PLATINALOY STRIP BANDS</b>  .004 x 125 x 1 3/4"		<b>ON PLATINALOY PINCH BANDS 1/8" WIDE</b>   <b>SOLDER COVERED</b>

**BAKER**

**ENGELHARD INDUSTRIES, INC.**

**BAKER DENTAL DIVISION**

850 PASSAIC AVENUE • EAST NEWARK, NEW JERSEY  
NEW YORK CHICAGO LOS ANGELES SAN FRANCISCO

THE WORLD'S LARGEST  
WORKERS AND REFINERS  
OF PRECIOUS METALS

## CONTENTS FOR APRIL, 1958

# American Journal of Orthodontics

### Original Articles

President's Address, Central Section of the American Association of Orthodontists. Thomas Speidel, Minneapolis, Minn. ....	243
Case Reports. Howard Yost, D.D.S., Grand Island, Neb. ....	245
The Age and Scope of Orthodontic Therapy. Earl E. Shepard, D.D.S., St. Louis, Mo. ....	257
Erikson's Technique With the Universal Appliance Extractions Indicated. George H. Parrot, Jr., Lieutenant Colonel, DC, USA ....	261
Relation of the Nasal and Subnasal Components of Facial Height in Childhood. Howard V. Meredith, Ph.D., Virginia B. Knott, Ph.D., and Ernest H. Hixon, D.D.S., M.S., Iowa City, Iowa ....	285

### Orthodontic Profiles

Harry Estes Kelsey. George M. Anderson, D.D.S., Baltimore, Md. ....	295
---	-----

### In Memoriam

Ralph Waldron .....	299
---------------------	-----

### Department of Orthodontic Abstracts and Reviews

Orthodontic Abstracts and Reviews .....	302
---	-----

### News and Notes

News and Notes .....	309
----------------------	-----

### Officers of Orthodontic Societies

Officers of Orthodontic Societies .....	324
---	-----

(Editorial and Business Communications on inside back cover)

SINCE 1929

ASK THE  
ORTHODONTISTS  
WE SERVE

# Orthodontist's Service

R<sub>x</sub> by  
prescription  
only

Dear Doctor:

We can add more hours to your "chair time" day, if we process your retainers and bite plates.

Whether it is an acrylic type all-metal retainer, you may be certain it will go to place with a minimum of effort, thus increasing your "chair time" for other operative needs.

Air Mail Special Delivery delivers a finished appliance anywhere in the United States in time to meet your patient's appointment.

Sincerely

Orthodontist's Service

P.S. A postcard will bring our brochure "B."

## To Your Rx HAWLEY RETAINERS

Regulation Hawley  
Flat Wire Hawley  
Full Labial Hawley  
Arrow Clasp Hawley  
Expansion Screw Plate  
Coffin Spring Retainer  
Crozat Retainer  
Johnson Retainer  
Sillman Retainer  
Sillman Splint  
Jackson Retainer  
Higley Split Plate  
Skeletal Retainer

## ACRYLIC BITE PLATES

Anterior Bite Plate  
Acrylic Guide Plane  
Northwestern Bite Plate  
Posterior Bite Plate  
Full Occlusal Splint  
Lower Reverse Incline  
Sved Bite Plate  
Sved Distal Drive  
Lingual Anchor Plate  
Monablock  
Acrylic Chin Cap  
Acrylic Mouth Shield

## FIXED APPLIANCE DEPT.

Soldered Linguals  
Removable Linguals  
Space Maintainers  
Swedged Bands  
Molar—Cuspid  
Extra-Oral Bows

— • —  
Stainless Steel  
or  
Precious Metal

123 WEST 64th ST. • NEW YORK 23, N. Y. • SUsquehanna 7-1418-9

SERVICES LIMITED TO ORTHODONTICS • "You Prescribe it. We make it"

*A Standout Down Through the Years!*

# Anderson PRACTICAL ORTHODONTICS

by

GEORGE M. ANDERSON, D.D.S.

Formerly Professor of Orthodontics, Baltimore College of Dental Surgery, Dental School, University of Maryland.

With Chapters by: Bernard Wolf Weinberger, B. Holly Broadbent, Alfred Paul Rogers, Earl W. Swinehart, Chester F. Wright, and Edward A. Kitlowski.

Eighth Edition. 702 Pages. 719 Illustrations.

Price, \$17.50.

This has been a standard text for many, many years, covering the sound principles of orthodontics and giving the reader material on occlusion, extraction, the approach to treatment, methods and aids to treatment, along with mechanistic procedures for orthodontic problems.

This edition contains 24% more text material and 12% more illustrations.

The term "normal occlusion" is analyzed and defined so that it better fits the adaptive pattern of the individual.

The equilibration of occlusion to eliminate disharmonies and as an aid to orthodontic treatment results is an addition to the text.

Inheritance, vital factor in all life processes, but in particular as it affects facial form, receives attention.

Additions of anthropometric considerations and cephalometric appraisal indicate the importance each of these fields has assumed in orthodontic practice.

Prophylactic or preventive orthodontics is included, and habits as an etiological factor are

more definitely emphasized because of the public's interest and what might be called confusion in understanding how habits create forces which develop malocclusion of the teeth.

Extraction as an aid to treatment is broken down in its component parts, so that from incisors to third molars reasons for and against the practice are stated and discussed in much detail.

There is new material on cleft palate and the effect of musculature as an aid in the newborn infant in cleft closure. The entirely new subject of osteoporosis or craniotabes as it affects the skull, face, and jaws and influences malocclusion is included.

Mechanistic improvement in the removable appliance field adds a real measure of technical interest, and the addition or more material relative to extraoral anchorage in the former of cervical head strap outlines the possibilities in this intriguing phase of clinical effort.

Methods to aid in the betterment of business details and improvements in records are described and illustrated, for they comprise a most important adjunct in the smooth conduct of a busy practice.

THE C. V. MOSBY COMPANY  
3207 Washington Blvd.  
St. Louis 3, Missouri

Date \_\_\_\_\_

Gentlemen: Send me Anderson "PRACTICAL ORTHODONTICS." Price, \$17.50.

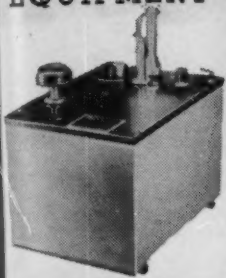
☐ Attached is my check. ☐ Charge my account.

Dr. \_\_\_\_\_ Street \_\_\_\_\_

City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

ORTHO-4-58

## EQUIPMENT



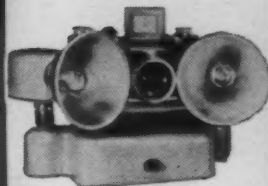
## FURNITURE



## OPERATING AIDS



## PHOTOGRAPHY



## LABORATORY AIDS



## INSTRUMENTS



# 5 Minutes!

Dear Doctor:

Have you 5 minutes to look through the catalogue we sent you a few months ago? There are a number of items, exclusively ours, that will assist you in saving hours of "Chair Time."

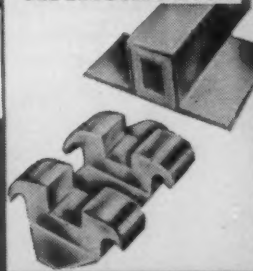
New brackets—New attachments  
—New tubes—New materials—  
New pliers—New aids.

Cordially yours,  
Betta Orthodontic Supplies

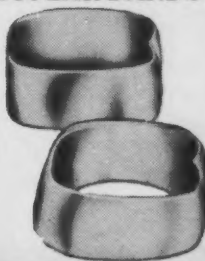
## ORTHO WIRES



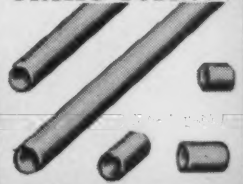
## ATTACHMENTS



## MOLAR BANDS



## ORTHO TUBING



# BETTA ORTHODONTIC SUPPLIES

3 WEST 64TH STREET • NEW YORK 23

IF IT'S ORTHODONTIC . . . WE HAVE IT'

BETTA  
ORTHODONTIC  
SUPPLIES

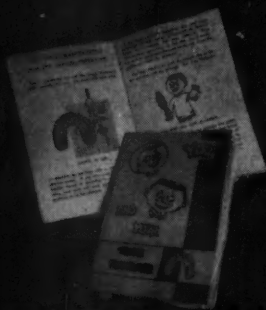
NOW . . . you get more with every

## POSITIONER \*

. . . and at no increase in cost



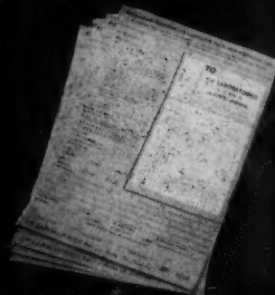
Compact, attractive T-P CASE affords protection for the POSITIONER. Graph built into the top helps encourage patient co-operation.



Instruction booklet entitled "You And Your Tooth Positioner" explains the use and purpose of the POSITIONER to both patients and parents - co-operation is definitely increased.



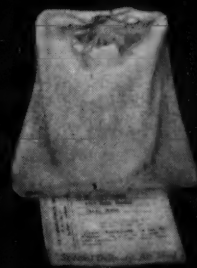
THE POSITIONER . . . Finest finishing appliance available.



Detailed instruction form avoids errors and delays in set-up at POSITIONER service.



Specially designed shipping boxes give your models excellent protection.



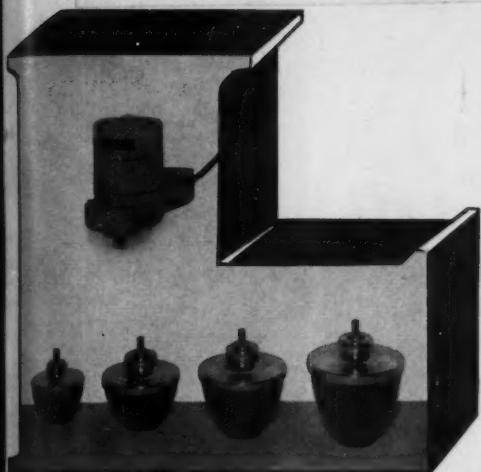
POSITIONER will be shipped via air mail when requested.

\*the POSITIONER is made exclusively by:

T-P LABORATORIES, Inc., Box 73, La Porte, Indiana

*Serving The Orthodontist*

VOLUME TIGHTLY BOUND

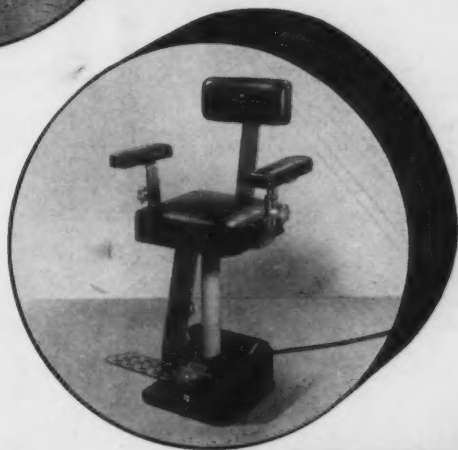
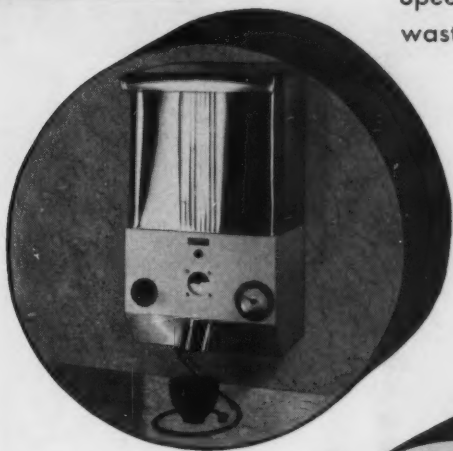


### MixOmatic

electric spatulator mixes plaster and impression material bubble-free in 10 seconds. Optimum results! Compact, quiet, easily cleaned. Bowl sizes 150, 350, 600, 850, and 1200 c.c. available.

### ExactOmatic

plaster-water dispenser automatically dispenses any quantity of plaster and water at desired ratio ready for spatulation. Provides consistent quality. Speeds production. Eliminates guessing and waste. Dimensions: 15 x 28 x 11.



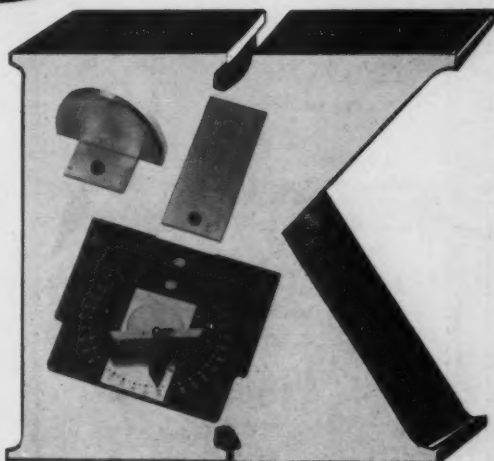
### HydroSeat

Electrically operated positioner for cephalometric radiography and diagnosis. A sturdy, attractively finished chair for precision, effortless positioning. Occupies only one square foot. Choice of accessories and color.

### AngOlator

A precision instrument for fast, accurate model trimming. Gives geometric results without guessing. Requires no maintenance — corrosion resistant. Easily installed.

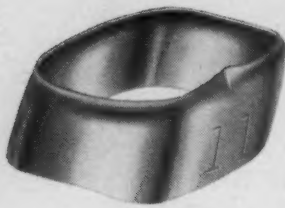
DESIGNS FOR EVERY MAKE MODEL TRIMMER



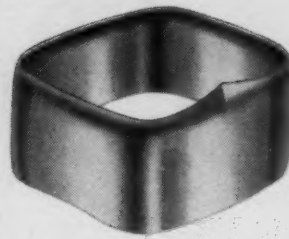
**T H E   K L I P P E R T   C O M P A N Y**  
P . O .   B O X   4 4 5 ,   N A P A ,   C A L I F O R N I A

## STANDARD WIDTH BANDS

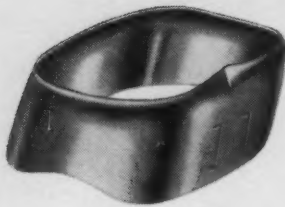
PRINT IN BINDING



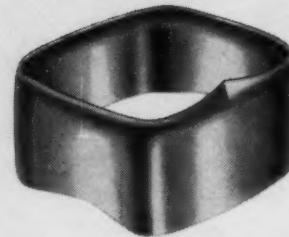
Lower-Standard Width Band  
Plain



Upper Standard Width Band  
Plain

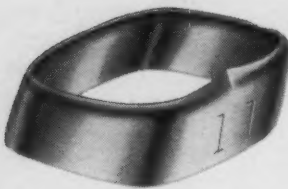


Lower Standard Width Band  
Festooned

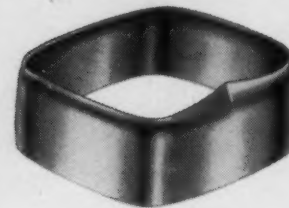


Upper Standard Width Band  
Festooned

## NARROW WIDTH BANDS



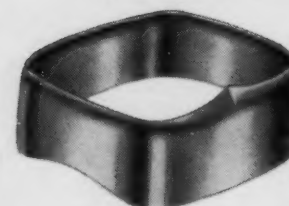
Lower Narrow Width Band  
Plain



Upper Narrow Width Band  
Plain



Lower Narrow Width Band  
Festooned



Upper Narrow Width Band  
Festooned

## NEW SIZE

SIZE AV. ME  
DISTAL DIA. (in)

1	1
1 1/2	1
2	1
2 1/2	1
3	1
3 1/2	1
4	1
4 1/2	1
5	1
5 1/2	1
6	1
6 1/2	1
7	10
7 1/2	10
8	11
8 1/2	11
9	11
9 1/2	11
10	11
10 1/2	11
11	11
11 1/2	11
12	11
12 1/2	11
13	11
13 1/2	11
14	11
14 1/2	11
15	11
15 1/2	11
16	11
16 1/2	11

## THE LAST WORD FOR PREFAB MOLAR BAND TECHNIQUES

You will prefer Rocky Mountain's new molar bands... whether you use prefabrication routinely or just for certain cases.

These fine time savers have been patterned after the original Chrome Alloy prefabs, which have been used so successfully during the past 24 years. New refinements in form, size variation, temper, and finish have been added. R. M. Bands are the result of 2 years of die modernization plus 24 years of experience. They are not for limited application; Rocky Mountain bands have been engineered to meet *all* your prefab technique requirements.

### HERE ARE WAYS THE NEW R.M. MOLAR-BANDS CAN HELP YOU

**Complete selection of accurate anatomical forms makes better fitting bands.**

Buccal and lingual sides of the lower band are formed on a bias. The lower band has a slight trapezoidal shape toward the lingual with lingual groove for quick alignment. The sides of the upper band are straight and groove is on the buccal.

You can use these basic forms in standard width bands—plain or festooned... or in narrow width bands—plain or festooned.

**Full range of evenly spaced half sizes speeds fitting and eliminates need for stretching or additional sizes.**

**New tempering enables bands to fit teeth more naturally.**

Occlusal third of band is hardened and rolled to provide edge strength and seal cement within band. The body of the band is soft. Hence, it will slide easily over the tooth, adapting itself naturally to the contours during preliminary fitting.

**Patients respect the clean, healthy appearance of R. M. bands.**

Inside of bands have light velvet finish for better cementation. Outer surfaces are absolutely smooth and brilliantly polished.

In addition to manufacturing the finest, most complete selection of materials and instruments for all Chrome Alloy banding techniques, Rocky Mountain maintains three conveniently located offices to serve you. For additional information on materials or procedures contact the Rocky Mountain office nearest you. You will find that Rocky Mountain offers you more—in every way.

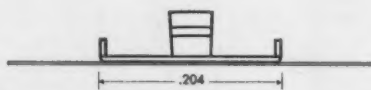
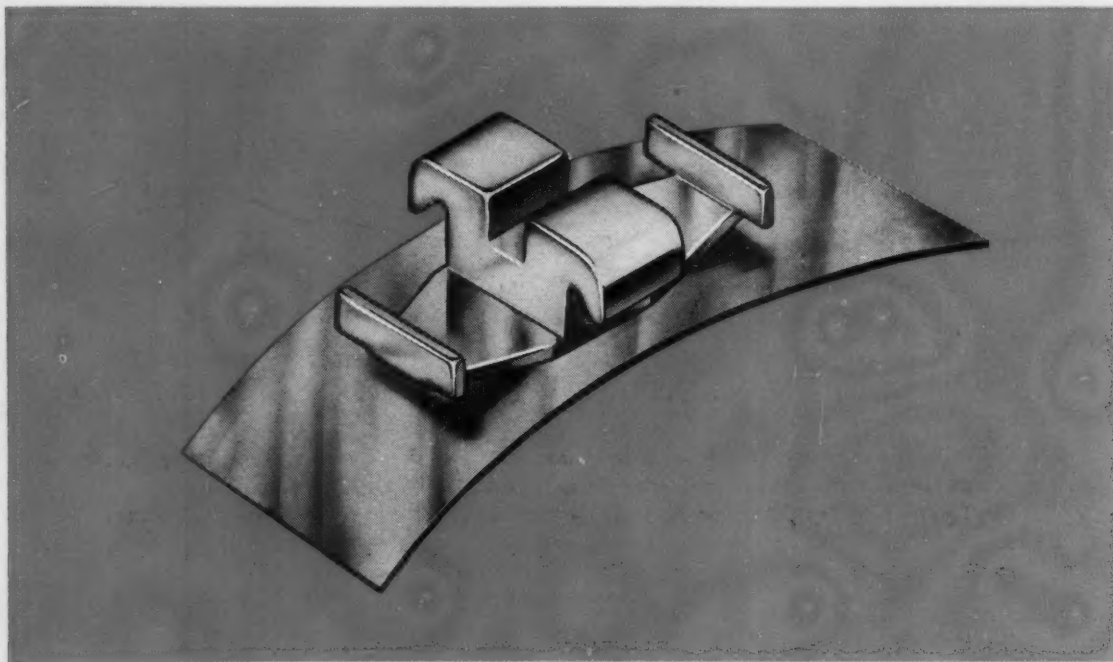
**ROCKY MOUNTAIN**  
New York Denver San Francisco

# UNITEK

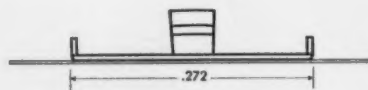
## ANNOUNCING THE STEINER PUSH-PULL ROTATION BRACKET

*...a completely new type of edgewise bracket which permits continuous action, gentle movement ...no staples or eyelets necessary*

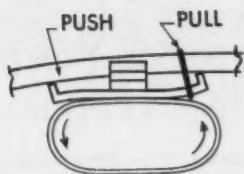
Through a principle in which the bracket assembly *itself* stores power to move teeth, the Steiner bracket makes possible gentle but positive movement of teeth. Special spring steel rotation arms, either or both of which can be used to push and pull, apply pressure more evenly over longer periods of time. As a result, fewer visits for adjustments are necessary and tissue changes are more physiological. Only one tie is required. Steiner brackets cause less discomfort for the patient and save chair time for the orthodontist.



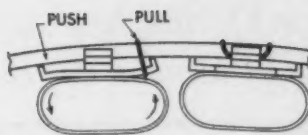
short—UT 651



long—UT 650



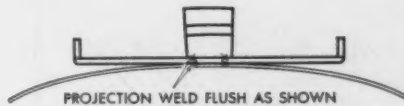
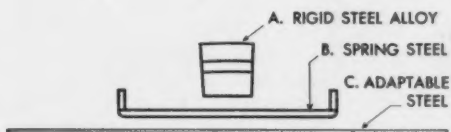
*Push-pull bracket uses double leverage to rotate tooth*



*Rotation is stabilized with minimum effort*

## THE PUSH-PULL PRINCIPLE

Energy is stored in the bracket itself—not only in the archwire. This energy comes from two resilient high spring stainless steel rotation arms which use the body of the bracket as a fulcrum, creating *double* the normal leverage through a simultaneous push-pull action as shown. The resiliency of the rotation arms keeps pressure *continuous*. The extra leverage afforded by the arms makes the pressure more *gentle* by distributing the force over a greater distance. The bracket is simple to use, too. It liberates the maximum amount of arch length between brackets for efficient tipping and torquing. It requires no eyelets or staples, and is activated with a single ligature tie. Rotation, once accomplished, is easily maintained. Should it be desirable to over-rotate teeth, or to compensate for slightly faulty band and bracket placement, the extension arms may be adjusted in the patient's mouth.



## UNIQUE MULTIPLE CHROME ALLOY CONSTRUCTION

- A. BRACKET—A strong and durable alloy that assures control of tipping and torquing, and makes possible the use of single brackets in most cases.
- B. ROTATION ARMS—Made of high spring stainless steel for gentle, continuous rotation.
- C. BAND MATERIAL—An adaptable alloy, resistant to discoloration and displacement in the mouth.

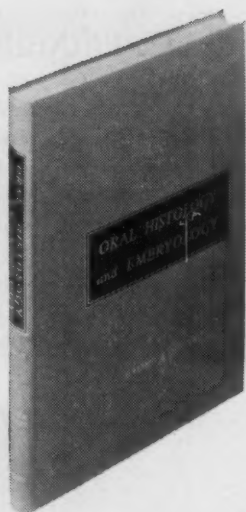
Steiner Push-Pull Edgewise brackets are supplied only pre-assembled to band material. This is necessary because a special projection welding technique is required to make welds directly under the base of the bracket, and thus take full advantage of the resiliency of the spring-steel rotation arms. Brackets are supplied with long or short rotation arms, on standard band materials of your choice.

*Please write for your complimentary professional samples*

U N I T E K C O R P O R A T I O N

275 North Halstead Avenue • Pasadena, California

*Do you fully understand the biological developments of the face and teeth?*  
**Sixteen Dental Authorities Collaborate to Aid You in Cor-  
 relating Clinical Procedures with Biological Foundation**



Edited by **BALINT J. ORBAN**,  
 M.D., D.D.S., Loyola Univer-  
 sity School of Dentistry, Chi-  
 cago, Illinois. Written by 16  
 leading authorities. 4th edi-  
 tion, 379 pages, 269 illustra-  
 tions, 4 in color. 1957. \$9.00.

## in Orban's **ORAL HISTOLOGY and EMBRYOLOGY**

Knowledge of basic factors and principles differenti-  
 ate a dependable good man in the healing arts from  
 a poor one. With this approach in mind, **ORAL  
 HISTOLOGY AND EMBRYOLOGY** presents a  
 thorough discussion of the development of the face  
 and teeth, of all hard and soft tissues and all support-  
 ing tissues, and shows how the practical application  
 of this knowledge can make you a better oral prac-  
 titioner.

This book is not only a description of structure, but  
 a discussion of all biological features in relation to  
 their functions as well as to the practical problems of  
 dentistry. A unique feature of this book is the special  
 appendix at the end of each chapter titled, "Clinical  
 Considerations" which gives you the practical, clinical  
 applications of material discussed in that chapter.  
 Written by 16 leading dental authorities—each a spe-  
 cialist in his field, this monograph is an accumulation  
 of a wealth of clinical knowledge and experiences.

The fourth edition of this valued book describes new  
 developments in electron microscopy and micro chem-  
 istry. It also includes detailed discussions of the  
 Development of the Face and Oral Cavity, Develop-  
 ment and Growth of Teeth, Enamel, The Dentin,  
 Pulp, Cementum, Periodontal Ligament, Maxilla and  
 Mandible, The Oral Mucous Membrane, Glands of  
 the Oral Cavity, Eruption of the Teeth, Shedding  
 of the Primary Teeth, Temporomandibular Joint and  
 The Maxillary Sinus.

**Mark and Mail This Coupon Today!**

*Order today from*

**THE C. V. MOSBY CO.**

**3207 Washington Blvd.  
 St. Louis 3, Mo.**

**THE C. V. MOSBY COMPANY** Date \_\_\_\_\_  
**3207 Washington Blvd., St. Louis 3, Mo.**

Gentlemen: Send me on 10-day approval Orban  
 "Oral Histology and Embryology," priced at \$9.00.  
 I understand that if I am not completely satisfied I  
 can return the book within 10 days and my money  
 will be completely refunded.

☐ Payment enclosed.

☐ Charge my account.

Dr. \_\_\_\_\_

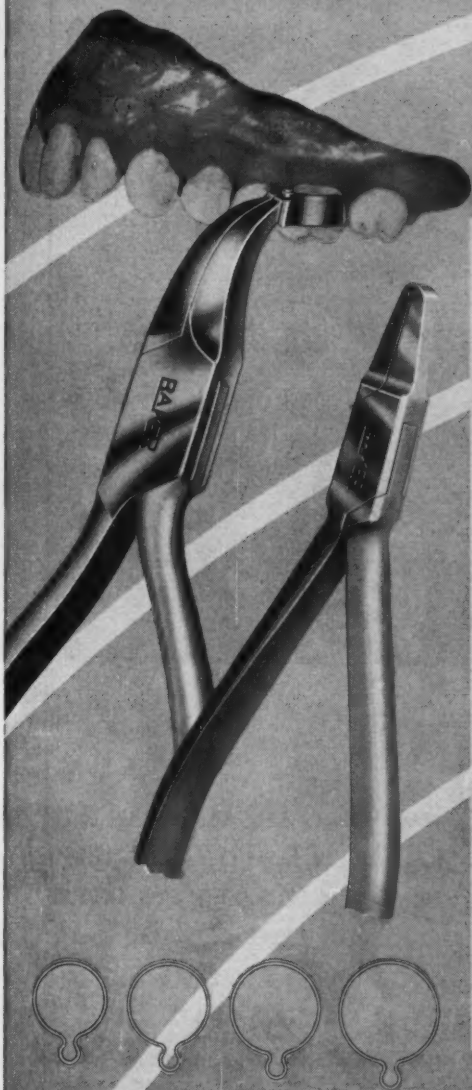
Street \_\_\_\_\_

City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

ORTHO-4-58

# JOHNSON LOOP BANDS

*Four Sizes Meet Every Requirement*



Johnson Loop Bands are made from Oralium Band Material which consists of a sheet of the precious metal alloy, Oralium, welded between two sheets of pure platinum.

When you push the bands over the crown of a tooth, the loop opens. After shaping and burnishing, close the loop with curved pliers, if upper; straight if lower. Remove and solder.

Notice that the bands are contoured just enough so that you will obtain a perfect fit. They are softened when you receive them, ready to shape against the tooth. They harden when cooled slowly.

Since adding the fourth size and making some other slight improvements, we have received the most gratifying compliments from the Profession.

You need to stock only four sizes of bands; No. 1 Small, No. 2 Medium, No. 3 Large and No. 4 Extra Large.

A beautiful and neat gumwood box is supplied free with each original order for 50 or more bands.

**ENGELHARD INDUSTRIES, INC.**

**BAKER DENTAL DIVISION**

**850 PASSAIC AVENUE • EAST NEWARK, NEW JERSEY**  
NEW YORK    CHICAGO    LOS ANGELES    SAN FRANCISCO



**N**OW he is like a tightly wrapped bud. But, petal by petal, you will help the future unfold in your child. Sobering idea, isn't it? Makes a thoughtful parent resolve to begin saving now for the richer future a good education can provide. And what better way to save than with U.S. Savings Bonds? Where nothing can harm that education fund. Where saved dollars earn 3¼% interest when Bonds are held to maturity. And where saving is surer—because you can buy Bonds regularly where you bank or automatically through the Payroll Savings Plan where you work. Why don't you start your Bond program today? Make life more secure for someone you love.

The U. S. Government does not pay for this advertisement. It is donated by this publication in cooperation with the Advertising Council and the Magazine Publishers Association.



# Pre-Curved WELDING FLANGES MAKE CHROMEX BRACKETS FIT BETTER!



GT1



GT2



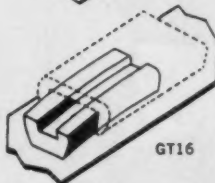
GT3



GT4



GT5



GT16

All Chromex Bracket assemblies except Chromex Twin Arch Brackets—the original flangeless attachment—are offered with accurately pre-curved welding flanges which are designed to fit around the natural curve of the tooth.

For your added convenience, these high quality brackets are also supplied in special "Time-Saver" assemblies consisting of brackets electronically welded to your favorite band material size. These "Time-Saver" assemblies assure precision centering.

## EDGEWISE BRACKETS

Pre-Curved Welding Flanges • Straight Square Sided to Accommodate Wire to Fullest Depth Without Binding or Protruding • Quicker and Easier Working Ligature Wings • Rounded Edges and Smooth Surface • Extremely High Lasting Polish • Stainless

	Dozen	Gross
GT 1 Anterior Edgewise Brackets	\$1.80	\$19.50
Electronically Welded to Band Material	2.80	30.50
GT 2 Posterior Edgewise Brackets	2.30	25.50
Electronically Welded to Band Material	3.30	36.25
GT 3 Wide Double Edgewise Brackets	2.30	25.50
Electronically Welded to Band Material	3.30	36.25
GT 4 Medium Double Edgewise Brackets	2.30	25.50
Electronically Welded to Band Material	3.30	36.25
GT 5 Narrow Double Edgewise Brackets	2.30	25.50
Electronically Welded to Band Material	3.30	36.25

## TWIN TIE CHANNEL ATTACHMENTS

"Minimum Protrusion" Low Design • Large Ligature Apertures • "Full Length" Wings That Hug the Band • Quicker and Easier Ligating • Smooth Surface • High Polish • Stainless

	Dozen	Gross
GT 10 Twin Tie Channel Brackets .075 (narrow)	\$1.80	\$19.85
Prewelded to Band Material	2.80	30.50
GT 11 Twin Tie Channel Brackets .110 (wide)	1.80	19.85
Electronically Welded to Band Material	2.80	30.50

## TWIN ARCH-SLIDING CAP ATTACHMENTS

"Minimum Protrusion" Low Design • Smooth-Rounded Edges • Easy Seating New Caps • Positive Lock Tension • High Polish • Stainless

	Dozen	Gross
GT 16 Twin Arch Brackets (flangeless)		
Electronically Welded to Band Material	\$3.00	\$33.00
GT 20 Sliding Lock Caps for Twin Arch Brackets	2.00	22.00

All types and sizes of Brackets as well as Prewelded Assemblies may be intermixed at gross rate. Gross Rate Prices computed at a 10% reduction over dozen prices.

Special 25% Discount is allowed on 5 gross orders (Intermixed if desired). Write for particulars on Special Discount Rates.



Send for Catalog

**GILBERT W. THROMBLEY**

33 WEST 42nd STREET, NEW YORK 36, N. Y.

Formerly Atlantic Coast Distributor for  
Rocky Mountain Metal Products Co.

RETAINERS are...

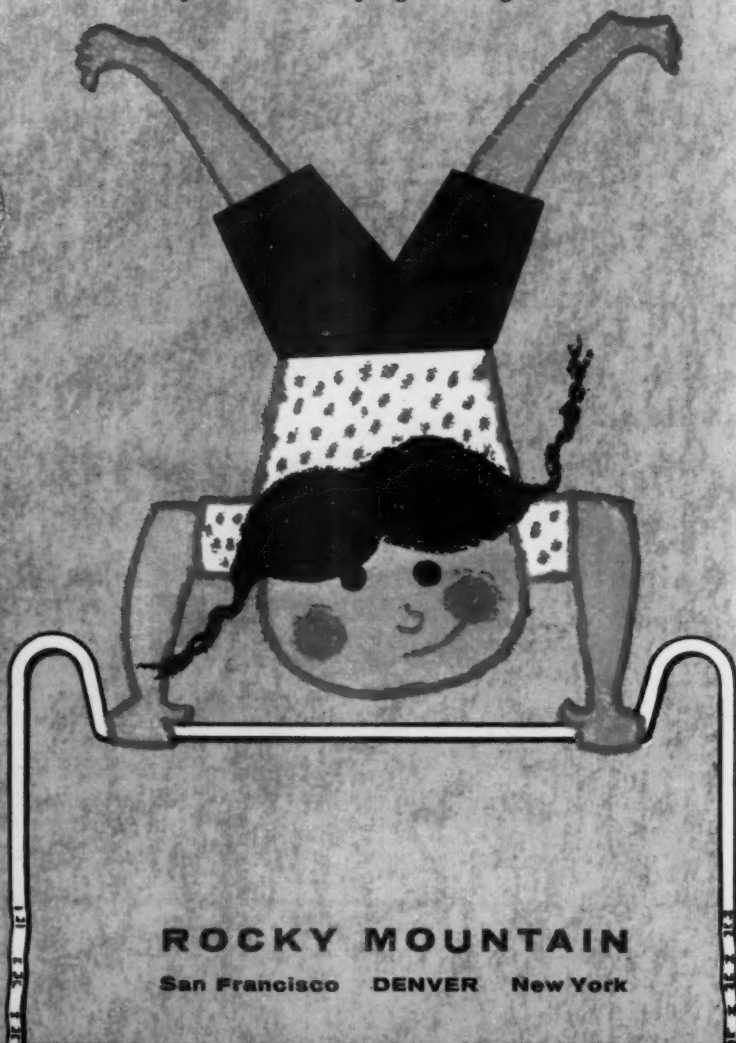
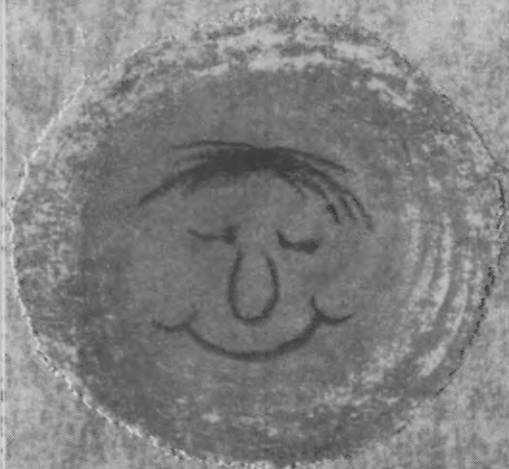
# FUN

With R. M. Elgiloy Retainer Forms.

The procedure is simple: (1) Select size by estimation or by measuring with R. M. Retainer rule. (2) Bend extensions between premolars, as desired. (3) Adjust prefab loop for inbetween sizes, if necessary. (4) Use semi-soft, as furnished, or heat-treat for added resiliency. (5) Complete plastic portion using quick cure acrylic spray-on technique.

The Introductory Assortment is the R. M. #K-150 Kit, \$6.00, consisting of 3 each of 8 sizes.

You will like Elgiloy Retainers, whether you employ them routinely or just for rush cases. They save you valuable time... They reduce annoying breakage.



**ROCKY MOUNTAIN**

San Francisco DENVER New York

# American Journal of ORTHODONTICS

(All rights reserved)

VOL. 44

APRIL, 1958

No. 4

## Original Articles

### PRESIDENT'S ADDRESS, CENTRAL SECTION OF THE AMERICAN ASSOCIATION OF ORTHODONTISTS

THOMAS SPEIDEL,† MINNEAPOLIS, MINN.

IT IS my happy privilege and duty to declare this twentieth annual meeting of the Central Section of the American Association of Orthodontists to be in session. On behalf of the Twin City Orthodontists, I extend to each of you a cordial welcome. We were happy to see so many of you at our party last night.

It is a distinct pleasure to know that so many have registered for this meeting and to see such a fine crowd here for the opening session. The excellent attendance that we always have at our Central Section meeting occurs for several reasons. Among them are these three:

1. The pleasure that we find in seeing our friends again.
2. The enjoyment of exchanging some shop talk with sympathetic colleagues.
3. The stimulation and improvement that we gain by learning from the fine essayists, case reporters, and clinicians on our program.

This last motive, the desire to learn, is one of the marks of a professional man. The fact that you are here for this meeting is proof that you are interested in your professional education. For this you are to be commended. I am sure that the fine program which our committees have secured for us will be both enjoyable and educational.

While the word *education* is still fresh in our minds, I should like to raise a question about the extent of our interests in orthodontic education. The

Presented at the annual meeting of the Central Section of the American Association of Orthodontists, Minneapolis, Minnesota, Sept. 23, 1957.

†Deceased.

question is a simple one: "Are all of us sufficiently interested in *all* of the phases of education in orthodontics?"

Education in orthodontics must occur at several levels or in several phases. One is the program for all undergraduate dental students. Second are the programs for persons who plan to practice clinical orthodontics. Third are the opportunities for family dentists and other professional personnel to learn more about orthodontics. Fourth are the opportunities for specialists in orthodontics to continue their learning.

Because education is such a personal thing, it is both an investment in oneself and a gamble on oneself. Many of us, when we think about education in orthodontics, are inclined to think mainly about the phases that fit our particular status. For example, the busy specialist in orthodontics is most likely to think principally of opportunities that exist for him to learn, giving only passing thought, if any, to the other three phases of education in orthodontics.

All programs of education—those carried on by such organizations as ours and those carried on by schools—deserve our best support. By "our" I mean each of us as individuals. By *support* I mean help—help for the programs of professional groups and for the programs of the schools.

How can educational programs be helped by individual persons? Individual persons help in many ways, depending on their abilities and interests, but all of these ways are based on giving something of oneself. We help by giving understanding, by giving effort, by giving time, and by giving material things.

May I earnestly commend to you, as worthy recipients of your support and your help, all of the phases of education in orthodontics in all schools and organizations, including the programs for undergraduates, for preparation of specialists, for family dentists and other professional personnel, and for the continuing education of orthodontists.

## CASE REPORTS

HOWARD YOST, D.D.S., GRAND ISLAND, NEB.

**D**URING the past two decades in American orthodontics, considerable study has been made and reported in the literature with respect to extraction of permanent teeth to expedite the treatment of malocclusion and malrelation of the jaws.

The most recent evolvement in the simple extraction cases has become serial extraction—first of deciduous cuspids and deciduous first molars, followed by extraction of the first premolars upon their eruption. This procedure was developed to facilitate the eruption of the permanent cuspid into the space of the first premolar when it seemed apparent that the arch could not accommodate the six anterior teeth in an even alignment and symmetrical arch in upright positions in the alveolar bone.

As is true of all good things, abuses sometimes creep into the use of serial extraction. As of now, some present-day practices advocate the evisceration of the first premolar crown when the deciduous first molar is extracted. In many of these instances the first premolar is removed before the denture has had the opportunity to express its full potentiality of growth. I am making a plea, therefore, for serial treatment before too hasty decisions are made in favor of serial extractions. Obviously, both of these procedures deal with younger patients, children of 6 or 7 years up to the ages of 8 or 9 years. Whenever it is possible to have patients present at these ages, it is possible to make serial studies to appraise the patient's pattern of growth as well as the development of the masticatory mechanism. Often interceptive measures may be instituted to prevent developing malocclusion. On the other hand, after serial studies are made it may develop that serial extraction is the best approach to the problem.

Of the two cases reported here, one is an extraction case and the other is a nonextraction case.

**CASE 1.**—An 11½-year-old girl presented a unilateral anteroposterior dysplasia of the right buccal segments of the maxillomandibular relationship of the teeth (Fig. 1, A).

Twenty-eight teeth were fully erupted and the four third molars were present (Fig. 2, A). The patient's father had a maxillary protrusion, and the mother's teeth were in acceptable occlusion and alignment. The child was in good health, with healthy oral tissue and a mild amount of dental decay. The tongue was of average size and normal function. The tonsils and adenoids had been removed at an early age. The nose, lips, and breathing were in normal function. The facial muscles were of good tonicity.

A gnathostatic appraisal of the casts indicated a contraction of both dental arches from the second premolars forward (Fig. 2, A).

Presented before the Central Section of the American Association of Orthodontists, Minneapolis, Minnesota, September, 1957.

There was a dental protraction of the maxillary right lateral segment, with a resultant mandibular retraction of the right mandible.

The lips were somewhat pouched and protrusive (Fig. 3, *A*).

The overbite was considered excessive because of lack of alveolar height of mandibular buccal segments (Figs. 1, *A* and 4, *A*).

Fig. 1.



Fig. 2.

Fig. 1.—*A*, Gnathostatic casts of girl, 11½ years of age, showing unilateral antero-posterior dysplasia of right segments of maxillomandibular relationship of teeth.

*B*, Casts after nineteen months of active treatment and four months of retention.

*C*, Casts two years later after all retention was removed.

Fig. 2.—Occlusal views of casts. *A*, Before treatment; *B*, after nineteen months' active treatment and four months' retention; *C*, two years after completion of treatment.

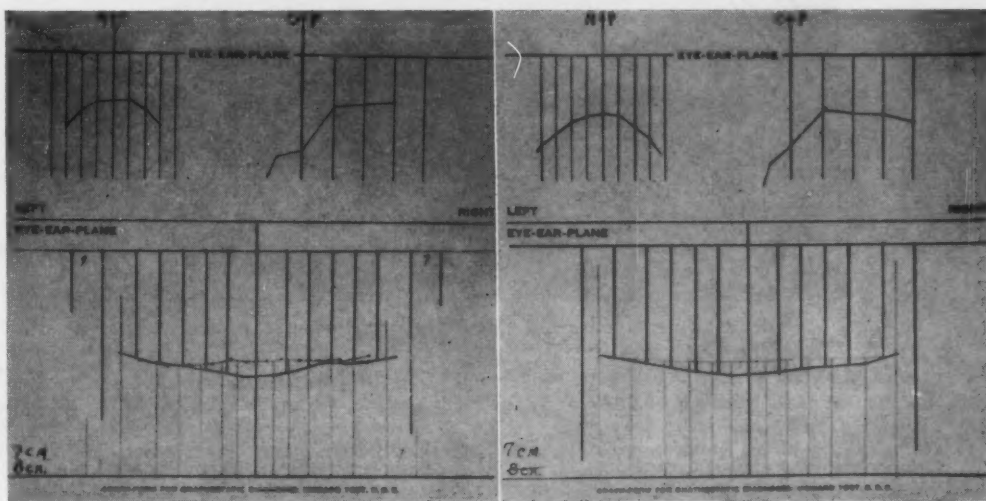
The case was treated by the extraction of the lower right second premolar and of the first premolars in the other three quadrants.

The appliances consisted of bands on all first molars, the four premolars, and four cuspids (Fig. 5). No incisor bands were placed at this time. The brackets used on molars and premolars were 0.020 inch buccal tubes. These were so aligned on each tooth as to permit the optimum axial alignment of these teeth (Figs. 6 and 7). An 0.040 inch soldered lingual arch to the molar bands resting on the cingula of the four incisors was placed on the mandible (Fig. 7).



B.

Fig. 3.—Gnathophotostats. *A*, Before treatment, when the patient was 11½ years of age; *B*, after treatment, when the patient was 14 years of age.



A.

B.

Fig. 4.—Graphs of gnathostat casts. *A*, Before treatment; *B*, after treatment.

Note increase of downward growth in maxillary palatal arch from *A* to *B* (upper left *A* and *B*), as related to Frankfort plane. Upper right *A* and *B* indicate graph of sagittal plane as related to orbital plane and Frankfort plane

Lower graphs indicate amount of incisal overbite. *A*, Before treatment; *B*, after treatment.

Fig. 5.

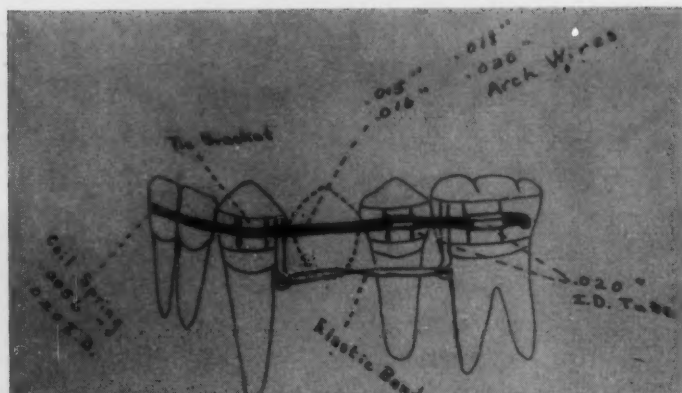


Fig. 6.

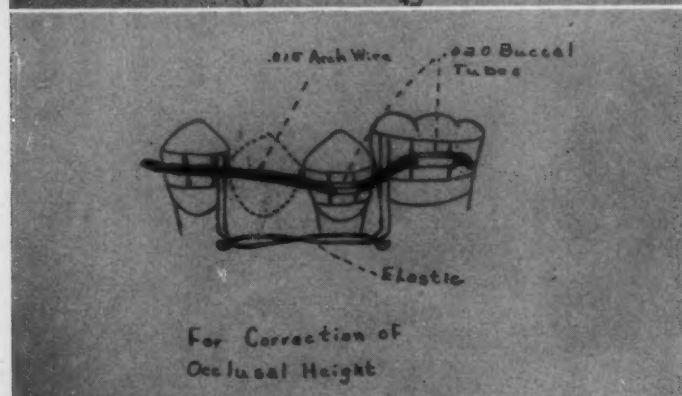


Fig. 7.

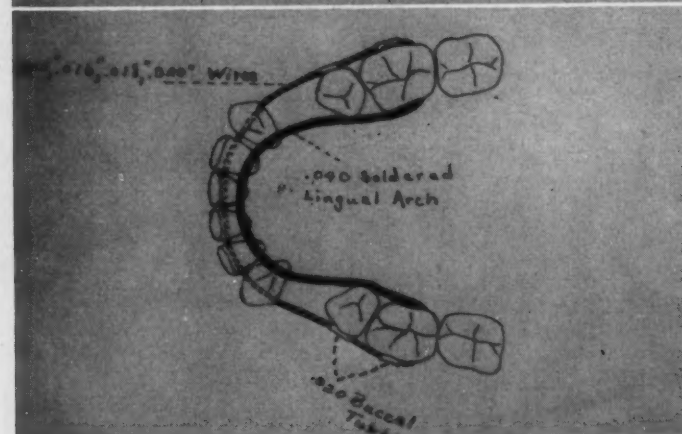


Fig. 5.—Schematic drawing illustrating method of closing first premolar spaces. Note hooks extending gingivally on cuspid and first molar bands for elastic traction. Attachments on second premolar and molar bands are 0.020 inch (inner diameter) buccal tubes; labial arch is 0.015 inch with subsequent 0.016 inch, 0.018 inch, and 0.020 inch labial arches.

Note coil spring between cuspids in incisal segment to assist elastic traction. Elastics are 2 ounces or less.

Fig. 6.—Method of elevating second premolar when below plane of occlusion with 0.020 inch (inner diameter) buccal tubes on premolar and molar. Molar bands have 0.040 inch soldered lingual arch to prevent mesial tipping.

Labial arch is 0.015 in. with subsequent 0.016 inch, 0.018 inch, and 0.020 inch labial arches.

Fig. 7.—Method of rotation of second premolar with 0.020 inch tube on buccal surface of band.

Arch wire is 0.015 inch, and subsequent arches are 0.016 inch, 0.018 inch, and 0.020 inch. In extreme rotation twin 0.010 inch wires may be used initially.

Soldered lingual arch (0.040 inch) adapted to cingulae of incisors to maintain molar position while cuspids are being moved distally.

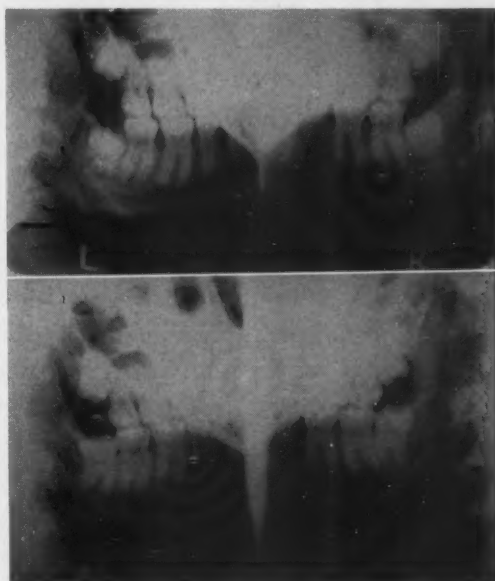
After cuspid movement, rotation, axial tipping, or occlusal alignment of second premolar, lingual arch is cut away to allow for closure of any remaining spaces.

Hooks were attached to all four cuspid and molar bands, extending gingivally about 5 to 6 mm., so that contraction elastics might be used to close the extraction spaces by moving the cuspids distally. An 0.015 inch round chrome nickel wire was formed for a full labial arch upon both the maxilla and the mandible (Figs. 5, 6, and 7). It has been found that a complete labial arch provides better stability against tipping or ducking of the molars and premolars and that it also counteracts displacement of the axial alignment and rotation of the cuspids. The elastics from the hooks on the mandibular and maxillary cuspids and molars provide against distal and mesial tipping, respectively, of these teeth when the contraction elastics are used. No contraction elastic was used on the maxillary right segment, since in that quadrant the maxillary molar was mesial to its antagonist.

An 0.018 inch (inside diameter) coil spring was placed upon the mandibular arch between the two cuspids to assist in their distal movement (Fig. 5).

After the cuspids were well on their way into the distal spaces, bands with tie brackets were cemented to the incisors of both jaws, and 0.010 by 0.020 inch flat labial arches were applied.

A.



B.

Fig. 8.—Extraoral x-ray picture of left and right sides of mandible, showing eruption of all four third molars.

A, Immediately after treatment.

B, Two years later.

Following the alignment of the incisors with the flat labial arches, 0.020 inch round arches were applied with eyelets incorporated mesial to the cuspid brackets; these were to be used as hooks for elastics. At this time the lingual arch in the mandible was removed and contraction elastics were extended from the eyelets on the labial arches to the hooks on the molar bands to tip the incisors lingually.

The closure of all remaining spaces was completed in this manner. In some instances the use of Class III elastics to complete the lingual movement of the lower incisors is required.

At this time it was found that the two right molars did not exhibit the proper articulation, since from the beginning the maxillary molar was in a rotated position. The maxillary right second premolar band was removed, a 0.020 inch coil spring was placed against the buccal tube of the right maxillary molar, and a rotation bend was made in the labial arch just mesial to the buccal tube for rotation of the molar. A Class II intermaxillary elastic was applied to assist the coil spring and bend to rotate and move the molar in a slightly distal direction.

The appliances were placed on April 2, 1953, and active treatment was concluded on Nov. 5, 1954, after a period of nineteen months. A maxillary Hawley retainer was placed at this time. The mandibular incisor and cuspid bands were left intact and an 0.010 by 0.020 inch labial arch was adapted to the incisal segment to conform to the alignment of the bands and was ligated into place. The four-month retention period was concluded in March, 1955. At this time the lower incisor bands were removed and complete posttreatment records were made, consisting of casts and intraoral, extraoral, and cephalometric roentgenograms (Figs. 1, B, 2, B, 3, B, 4, B, and 8, B).

One month later, the patient and both of her parents were called in for a posttreatment appraisal of the case and dismissal.

The patient was asked to return for a posttreatment observation two years later. At that time the final set of record casts was made (Figs. 1, C and 2, C).

This case report is presented (1) to confirm the original diagnosis and treatment plan and (2) to illustrate a method of closing extraction spaces with a minimum of trauma to the periodontium. Some may take exception to the amount of overbite still remaining in the incisal region two years after completion of treatment. However, it has been observed that the amount of overbite is quite peculiar to the individual patient. Clinical observation has revealed that the amount of incisal overbite adjusts itself to the peculiar skeletal pattern and the neuromuscular tolerance of the patient. In many instances, when deep overbites were altered to conform to what might be considered the ideal, a high percentage of cases relapsed to a point of muscular tolerance. Also, it has been found that when a given incisal segment of teeth is depressed to eliminate deep overbites, such segments do not remain depressed. Often these depressions result in injury to the periodontium and possible devitalizations. Conversely, when buccal segment teeth are over-extruded from their alveoli, they more often than not are forced back into the alveolar bone as a result of muscular intolerance and the result is trauma to the roots. Another observation might be made, namely, that the amount of incisal overbite should be in harmony with the cuspal height of the premolars and molars which, in turn, must exhibit a curve of spee that is harmonious with the cuspal height. Balancing of occlusion or equilibration may be part of the orthodontist's service immediately following treatment, but certainly it is a duty that must be relegated to the general practitioner or periodontist thereafter.

CASE 2.—The patient, a boy aged 8 years 8 months, had a so-called Class I malocclusion, or neutroclusion (Figs. 9, A and 10, A).

The cephalometric roentgenogram indicates a mildly backward divergent face, a medium convexity, with an A-B differential of -4 degrees (Fig. 16). The maxillary incisor was 90 degrees to the SN plane and +5 mm. from the NP plane. The lower incisor was 77 degrees to the mandibular plane, considerably below the average of 90 degrees. The mandibular plane, 41 degrees to the SN plane, exceeded standard deviation by a considerable margin; in other words, the mandible hung down from the cranial base. There was a mild antigonial curvature in the lower borders of the mandible. The NAB angle was 11 degrees, denoting a medium facial convexity. The dental height between points A and B was 45 mm. This was considerably above the average for the patient's age level. The arch length was deficient in the mandible.

Prognosis up to this point was good for the maxilla and fair to poor for the mandible. As a matter of fact, there was very little problem in the maxilla (Fig. 9, *A*).

A gnathostatic appraisal of the casts indicated a mild collapse of the maxillary left buccal segment as a result of premature loss of the deciduous left first molar. The same was also true of the mandibular left segment in which the deciduous second molar had been lost too early. The mandibular arch was also narrow, with the right lateral incisor crowded

Fig. 9.

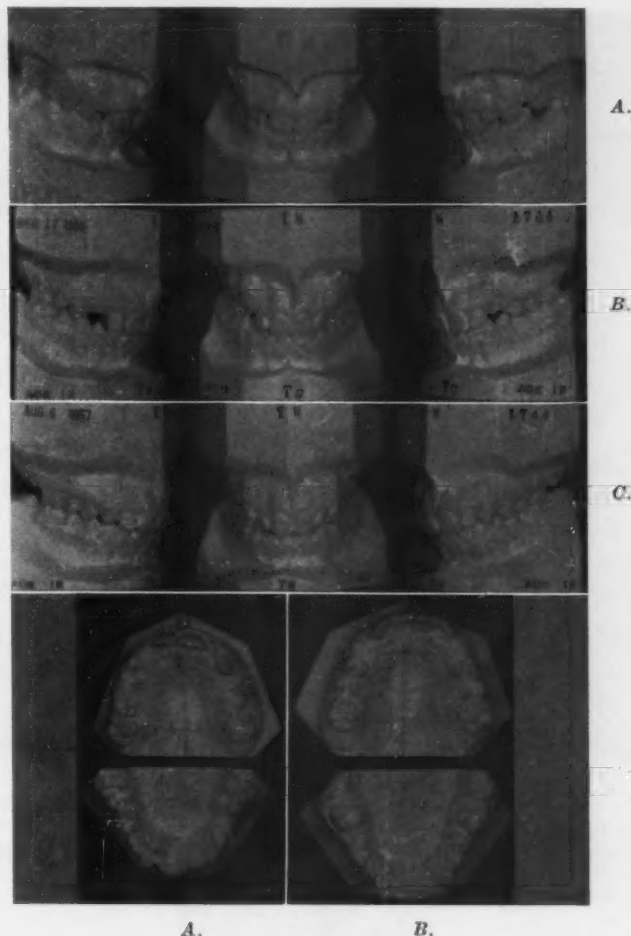


Fig. 10.

Fig. 9.—Photographs of gnathostatic casts. *A*, Boy, 8 years 8 months of age, exhibiting acceptable dental and jaw relationship. Maxillary arch is of adequate size. Mandibular incisors are extremely crowded and lower right lateral incisor shows complete lingual dysplasia. Discrepancy in dental arch size resulted in deep overbite of incisors.

*B*, Casts three months after completion of treatment (no retention).

*C*, Casts eleven months after completion of treatment.

Fig. 10.—Occlusal views of casts.

*A*, Before treatment. Note complete linguoversion of mandibular right lateral incisor.

*B*, Three months after treatment with no retention.

lingually. There was an excessive overbite of the incisors, with the maxillary incisors lingually inclined (Figs. 9, *A*, 10, *A*, and 11, *A*). Here again the prognosis in the mandible seemed rather poor.

It would seem that extraction of any teeth in the maxilla might produce a greater orthodontic problem than that which already existed and that extraction in the mandible could not

be tolerated without extraction in the maxilla. When the problem was discussed with the parents, they preferred nonextraction if at all possible. It was then explained that treatment might not be wholly successful on the lower teeth and that possibly a slight crowding of lower incisors might ensue.

Intraoral and extraoral x-ray films revealed the presence of twenty-eight permanent teeth, as well as a crypt in the lower left third molar area which later proved to be a third molar. There was no evidence of the presence of the other three third molars (Fig. 12, *A*).

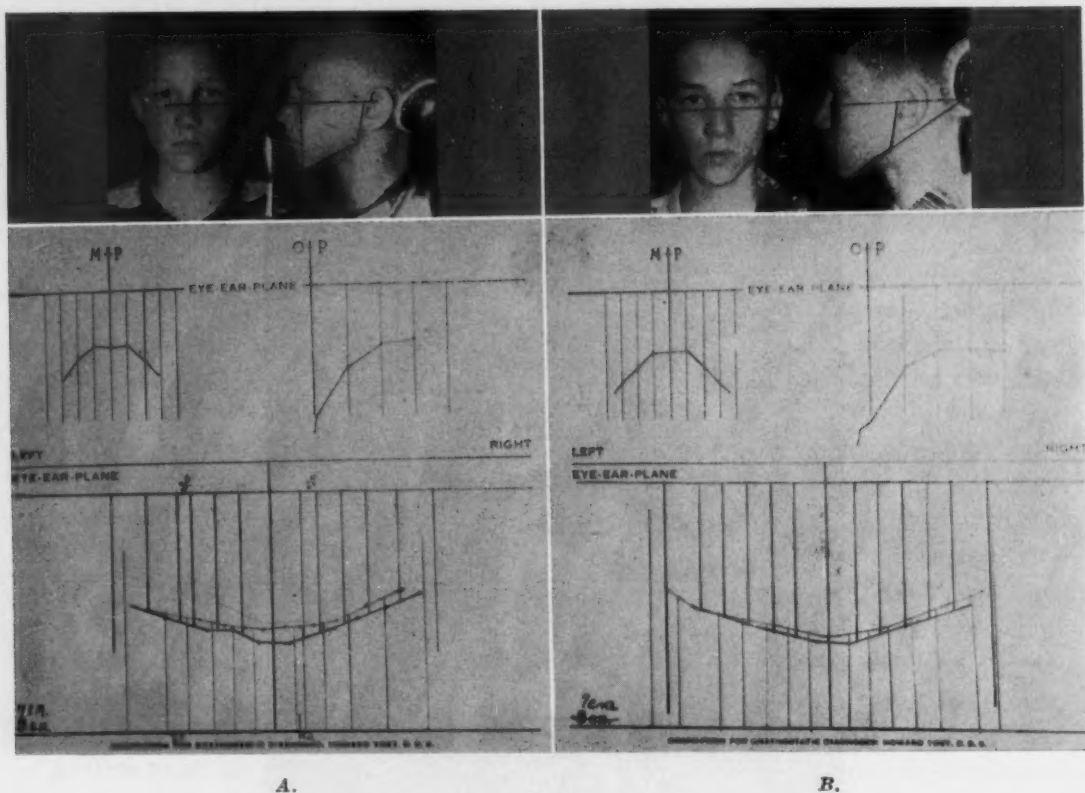


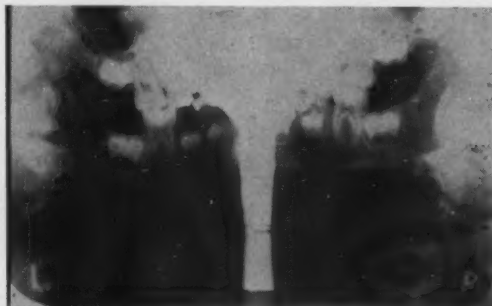
Fig. 11.—Gnathophotos and gnathograph of casts.  
*A*, Before treatment. Note width of bimolar dimension and palatal length as compared with *B* (after treatment). Lower graphs indicate amount of overbite.  
*B*, After treatment.

On June 15, 1953, an acrylic palatal plate was placed with an auxiliary spring to the upper left deciduous second molar to exert distal pressure to move the deciduous molar and first permanent molar distally (Fig. 13, *A*). This was broken and renewed in August, 1953. In August, 1954, the auxiliary spring was broken and another new plate was made without a spring. As the lateral incisors erupted, the acrylic was successively trimmed from the lingual surfaces. This type of plate was worn intermittently at night and sometimes during the day, during the patient's hours at home, until the first premolars erupted. On Jan. 18, 1956, a new palatal plate was inserted with an auxiliary spring to rotate the lateral incisor. This was also worn at night and intermittently in the daytime with successive trimming on the lingual side of the premolars for eruption. This was continued until Sept. 28, 1956, when all appliances were removed.

In the mandible the two deciduous cuspids were extracted at the outset to allow the incisor teeth to align themselves in the arch. An acrylic lingual appliance was placed in January, 1954, with an auxiliary spring to the left first permanent molar to recover the space that it had moved mesially as a result of the early loss of the second deciduous molar

(Fig. 13, B). This was worn until May 7, 1954, when bands were cemented onto the first molars with a soldered 0.040 inch lingual arch and an 0.015 inch auxiliary spring soldered from the left molar to span the incisor area to the right lateral incisor to move it labially and begin opening space for the right cuspid. On March 9, 1955, the molar bands were removed;

A.

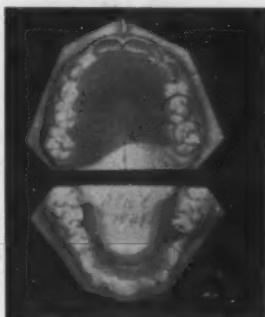


B.

Fig. 12.—Extraoral x-ray pictures.

A, Before treatment, showing all four second molars and crypt of lower left third molar.  
B, At completion of treatment, revealing only lower left third molar developing.

A.



B.

Fig. 13.—Acrylic appliances worn.

A, Maxillary appliance worn intermittently at night throughout treatment.  
B, Lower appliance worn for four months to upright left first molar before bands on molars and lingual arch.

a new soldered lingual arch was contoured to the incisors with 0.036 inch (inner diameter) buccal tubes welded to the bands and recemented. Bands were placed on the four incisors with sliding sleeve brackets to receive an 0.009 inch twin labial arch with end tubes inserted in the buccal tubes on the molars (Fig. 14). An 0.0056 inch coil push spring was placed on the twin arch, exerting pressure on the right lateral incisor to adjust the median line of the central incisors in conformity to the medial sagittal plane of the maxilla. This was done by

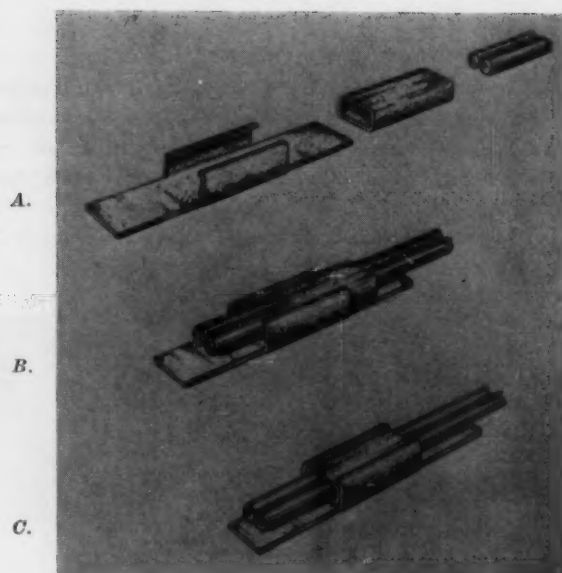


Fig. 14.—Components of sliding sleeve and bracket for twin arch mechanism.

A, Bracket, sleeve, and section of 0.010 inch twin wires. Bracket and sleeve fit with precision tolerance. Inner diameter of sleeve is 0.011 by 0.022 inch, allowing 0.001 by 0.002 inch tolerance of 0.010 inch twin wires in sleeve.

B, Engaging of sleeve in bracket.

C, Completion of assembly.

(From Yost: AM. J. ORTHODONTICS, May, 1950.)



A.

B.

Fig. 15.—One-quarter scale gnathophotostats.

A, Before treatment.

B, Three months after completion of treatment. Total time between photographs was three years and eight months. Note forward growth of maxilla. Mandible has grown downward more than forward, as exhibited by increase in length of ramus and angle of ramus and corpus. Extraction could not have restrained forward growth of maxilla or increased forward growth of mandible.

freezing the right end tube in the right buccal tube. Successive new 0.010 inch twin labial arches were placed until April, 1956, when a round 0.020 inch labial section was placed in the end tubes and snapped into the incisal brackets. At this time a new lingual arch was contoured to arch form with a recurved 0.016 inch auxiliary spring to the right two premolars to move them buccally until they rested against the buccal end section of the labial arch.

All appliances were removed in September, 1956, after three years and three months of treatment.

Now let us briefly summarize the treatment. No fixed appliance was ever worn on the maxilla. Only two different types of acrylic palatal plates were used. These were worn most of the time at night and intermittently during the day over a period of three years and three months, with a total wearing time of sixteen to eighteen months. Upon the lower arch an acrylic removable appliance was worn for a period of four months. A fixed lingual arch was worn for a period of twenty-seven months. A labial arch was worn for eight months.

Three months after removal of all appliances posttreatment records were taken (Figs. 9, B, 10, B, 11, B, and 12, B).

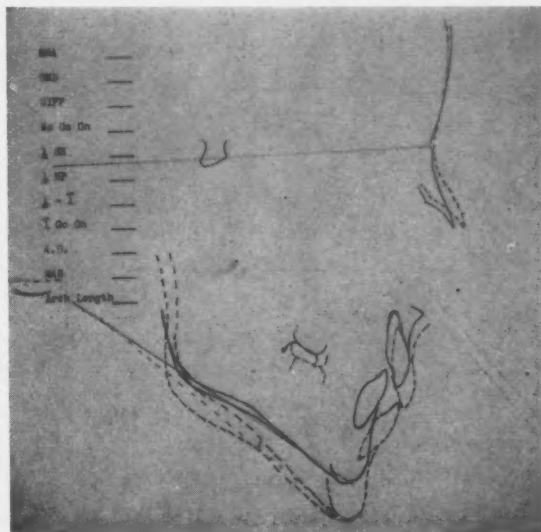


Fig. 16.—Composite roentgenographic cephalometric tracing, before treatment (solid lines) and after treatment (broken lines).

*Note:* No increase in line *SN*; forward position of upper part of face. Mandible has grown downward exhibiting greatest change with little, if any, forward growth. Only orthodontic change was in mandible by increasing arch length and forward tipping of incisors. The overbite decreased due to mandibular downward growth and slight labial tipping of incisors. Inasmuch as orthodontics can never become an exact science, it behooves us to accent the potential in border-line cases. For this reason a plea is made for intermittent or serial treatment before the individual potential is stymied by serial extraction.

A posttreatment appraisal session was held with the parents three months later, and eleven months after all appliances were removed other plaster casts were made (Fig. 9, C).

A final prognosis of this case cannot be made at this time. Had maxillary extractions been made, many more complications in that area would have been encountered.

The mandibular arch is in good form, size, and occlusal contact with the maxilla.

The last cast, made eleven months after removal of all appliances, does show a slight crowding of the lower incisors.

There are some who might take exception to this boy's posttreatment facial profile (Fig. 15). We must remember that these photographs were taken when the patient was 12 years of age, just at a time he was approaching puberty. We must not forget that the growing-up stage of the face takes place after puberty. Certainly nothing could be done to make this

boy's upper face and nose stop growing forward. Had maxillary teeth been removed, with a resultant retraction of the incisors, most assuredly the nose would have been more prominent. The lips are procumbent, but here again is the preadolescent posture with droopy lips.

Most extraction cases are commenced when patients are at the age this boy was when his treatment was finished.

May we not expect an amount of postadolescent facial development with improvement equal to that seen in extraction cases?

#### SUMMARY

In the first case presented here, there was no alternative but to extract to attain the desired occlusal harmony and facial esthetics. The second seemed to be a borderline case, with conservatism as the better part of valor.

In conclusion, is it not best to approach the younger patient, whose treatment might be in doubt, with the thought of serial study and treatment? Should this not be successful, then it would not be too late for extraction.

803 WEST DIVISION ST.

---

### **Plan Now to Attend 1958 Meeting**

#### **American Association of Orthodontists**

**Commodore Hotel, New York City**

**April 27-May 1, 1958**

On page 309 you will find an announcement concerning registration of members, associate members, and guests. Please read it carefully and act immediately.

Reservations for rooms should be sent directly to the Commodore Hotel, New York City. A full program of entertainment for the ladies has been prepared. New York is waiting for you.

## THE AGE AND SCOPE OF ORTHODONTIC THERAPY

EARL E. SHEPARD, D.D.S., ST. LOUIS, MO.

ORTHODONTICS has long been a specialty of paradoxes. On the one hand, an orthodontist is called upon by the general dentist to correct a malocclusion which has progressed to enormous proportions because of insufficient information on the part of this or another general dentist. On the other hand, there are many, many adult patients who are never informed that at least some compromise treatment might place them in a position to receive better restorative or replacement dentistry. Similarly, there are as many deciduous dentitions perhaps which are, in a manner of speaking, neglected because of lack of information on the one hand and preoccupation on the other.

Webster defines the word *provincial* as "narrow, limited," even "rude and countrified." Our past history as a specialty of dentistry has been brilliant, but not untinged with some of this quality. This applies both to the manner in which we have been taught as undergraduate students and to the basis upon which graduate orthodontics has been handled.

One of the best commentaries on the condition of some men's minds is contained in this paragraph from Lischer's *Time to Tell* (New York, 1955, Vantage Press): "Men love to cling to seeming bounds; they dislike discussions and progressive thought. As Sylvia F. Porter expressed it, 'I still meet almost daily men who think Coolidge just stepped outside for a minute and will be back right after lunch.'"

At the risk of being tedious, I call attention to Lischer's references to "orthodontic orthodoxy" and to a new (and better) method of correcting malocclusions of the teeth prevalent in the early years of the present century.

I am certain that we all come across patients who say, "Doctor so-and-so said I shouldn't have anything done until after my twelve-year molars have erupted." As transient as this process is, we all know that the twelve-year molars may well wait until the age of 14 to 15 years before erupting. These same patients will declare on the avowed authority of their family dentist that "nothing can be done after 16 years of age." There are many, many more instances of this than we realize.

And how may we remedy such a "practice by tradition?" Certainly the first effort should be made to provide elementary and practical information as such, for the dental student. No more should orthodontics be governed by the

Presented before the Central Section of the American Association of Orthodontists, Minneapolis, Minnesota, Sept. 24, 1957.

calendar or the "mechanical orthodoxy" of individual persons. In scanning the *AMERICAN JOURNAL OF ORTHODONTICS*, I find that the first allusion to timing of orthodontic therapy offered in the last ten-year period appears in an abstract from "Queries and Minor Notes," J. A. M. A., March, 1946. This was in the form of a question to the editor: "What is the earliest age at which orthodontic work should be begun on a child?" The answer:

"The earliest age at which orthodontic 'work' should be undertaken is that time when there exists a condition which stands in the way of normal growth, development, or function of the teeth and dental structure and which has little or no possibility of being corrected by further growth or developmental processes or by the institution of procedures which are simpler and less disturbing to the child.

"It is seldom practical to place orthodontic appliances before the deciduous dentition is complete, although occasionally this has been done with satisfactory results. The nature of the particular problem must be the determining factor.

"The correction of the condition may not prevent the occurrence of malocclusion from other causes at a later age and, in those conditions in which the malocclusion is due to discrepancies in harmonious relationships which arise from either genetic or growth and developmental causes, more than one period of orthodontic treatment may be advisable. Treatment in the early years in these instances is for the purpose of obtaining maximum functional contribution to the growth and developmental potentialities possessed by the child."

This, I believe, is the finest comment on treatment age ever published. Couched in scientific but understandable language, it is a splendid statement and one of which we should take cognizance.

Too often perhaps early therapy may be discarded in favor of so-called "observational guidance." In the practice of this latter, it is all too easy to allow the development, rather than the interception, of malocclusions. This may be the result of present-day economic conditions in which even the most astute is sorely tempted to select rather than to administer.

How often does one hear a parent exclaim, "My child has been under orthodontic care for ten years." Certainly, such persons never deduct the periods of inactivity from the total time. Herein lies one of the pitfalls of early treatment. Never should we be guilty of doing something to "keep the patient busy" or to maintain an active contact for particular design.

Many early treatment regimes are paramount in potency and excellence. However, they must be administered most carefully; this includes insistence upon cooperation on the part of patient and parent. Inattention to this administration relegates not only the therapy, but also the integrity of the profession, to the ridiculous.

Observational guidance need never carry with it a collection of needless records. Whether we admit it or not, only a bare handful of practitioners are capable of carrying out the intricacies of comprehensive records, both roentgeno-

graphic and clinically historical. It behooves us all to settle for an honest stabilized method of guiding our ministrations, both before and during the application of meehanotherapy.

For years the application of orthodontic care was focused upon the correction of malocclusions of the early or new permanent dentition. Then, with the fuller understanding of growth and development, the therapy was carried into the lower dental age brackets.

But what of the attention to adult dentition? For many years the vertical dimension of adult occlusions has been ministered to by practitioners of restorative dentistry. In many instances gross malocclusions were remedied by the extraction of all teeth and the replacement of the lost parts by prosthetic means. Often esthetics, as well as function, was scarcely enhanced.

It may be reliably stated, to the lasting credit of the reconstructive and restorative dentists, that they perhaps first approached orthodontists with the question: "Could you reduce this maxillary protrusion?" or "What about this anterior cross-bite?" Consultation with these patients revealed adults ranging in age from the early twenties to the middle fifties.

In proving that treatment could be accomplished, clinic patients, the condition and position of whose teeth were so perilous as to make no difference if therapy should be ineffective, were treated.

This clinical research was done only after reference to the limited material record dealing with movement of mature teeth and the more copious reference material on the histologic effect of pressure applied to the supporting structures through the teeth themselves. With the knowledge that orthodontic therapy in adult mouths was practical and desirable, many satisfactory results were forthcoming.

Just as the requests for consultation and cooperation with specialists in restorative dentistry have stimulated clinical research in adult patients, the requests for consultations on problems in complete deciduous dentures have provided impetus for very early attention to gross malocclusions.

Certainly the best type of case upon which to begin orthodontic treatment in 3-year-old mouths would be the extreme mesioclusion problem, the correction of which could in no way be attempted by a simple means, such as an anterior acrylic splint. This, therefore, was attempted only after clearly explaining the problem and implications of treatment to the parents. It has been most satisfying to observe the correction of these potentially disfiguring malocclusions and the almost unbelievably fine cooperation of patients scarcely within the age of cooperative understanding.

With the fine results obtained in the treatment of Class III malocclusions, the same type of appliance has been applied to carefully selected cases of true hereditary distocclusions. This is currently providing a most interesting series of cases to observe, with again very fine results. These cases are more carefully examined and only those with severe overbites and overjets are treated, inasmuch as they also carry the greatest esthetic deficiency.

We must not be bound by numbers of teeth, by chronology, by "orthodontic orthodoxy" in providing a health service and not merely a beauty treatment, although the latter is justly important. Our service to the patient in many instances is first of all, a tremendous lift and service to our fellow practitioners in restorative dentistry.

8230 FORSYTH BLVD.

---

**Plan Now to Attend  
1958 Meeting**

**American Association of Orthodontists  
Commodore Hotel, New York City  
April 27-May 1, 1958**

On page 309 you will find an announcement concerning registration of members, associate members, and guests. Please read it carefully and act immediately.

Reservations for rooms should be sent directly to the Commodore Hotel, New York City. A full program of entertainment for the ladies has been prepared. New York is waiting for you.

## ERIKSON'S TECHNIQUE WITH THE UNIVERSAL APPLIANCE EXTRACTIONS INDICATED

GEORGE H. PARROT, JR., LIEUTENANT COLONEL, DC, USA\*

### INTRODUCTION

SINCE the introduction of the Universal appliance by Atkinson<sup>1</sup> twenty years ago, little has been written on this subject.

In this paper I shall describe the treatment procedures utilized in the correction of a malocclusion requiring the removal of four premolar teeth. The method to be presented utilizes Atkinson's Universal appliance in a manner formulated by Erikson<sup>2</sup> and clinically tested by him for eighteen years.

I do not wish to imply that any originality is claimed; rather, I deem it an honor to be permitted to present the clinical application of the technique developed by Erikson. The personal instruction and counsel which I have received from Dr. Erikson<sup>3</sup> since April, 1953, has made this thesis possible.

The paper by Day<sup>4</sup> dealt primarily with Erikson's technique in the treatment of nonextraction cases, which comprise the majority of patients treated at Walter Reed Army Hospital. The extent of distal movement of buccal segments as described by Erikson and Day is not unlimited; consequently, it becomes necessary in some cases to remove teeth. The minority of so-called extraction cases has prompted the writing of this article.

### TREATMENT PLAN

In order to present a coherent step-by-step treatment procedure utilizing the Universal appliance in Erikson's technique, I have selected a Class I malocclusion, the original models of which are shown in Fig. 1. The malocclusion is a typical result of early loss of deciduous molars which permitted the mesial tipping of the mandibular permanent molars and the subsequent loss of space for the second premolars. Early loss of deciduous maxillary canines with subsequent mesial migration of the maxillary buccal segments, as well as an insufficient lateral growth in the anterior segment of the maxilla, have resulted in loss of canine space with a subsequent eruption of the canines in labioversion.

After a thorough study of the patient, the photographs, the study models, and the intraoral and cephalometric roentgenograms, it was decided that

This thesis, which was given as a partial fulfillment of the requirements for certification by the American Board of Orthodontics, is being published with the consent and the recommendation of the Board, but it should be understood that it does not necessarily represent or express the opinion of the Board.

\*Walter Reed Army Hospital, Washington 12, D. C.

extraction of four premolars was necessary in order to obtain a stable and functional dentition that was esthetically pleasing. I elected to remove the upper first premolars and the lower second premolars. Briefly, this choice was decided upon as follows: The maxillary first and second premolars were about

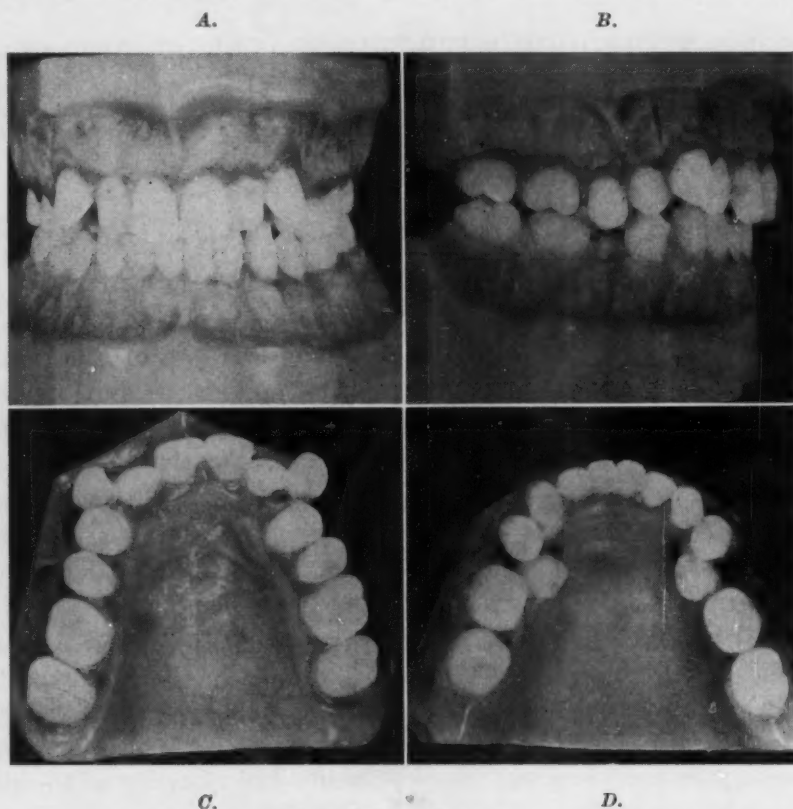


Fig. 1.—Models of patient before treatment. *A*, Front view. *B*, Right lateral view. *C*, Maxillary occlusal view. *D*, Mandibular occlusal view.

equal in size and both presented good axial position with no appreciable rotations. The extraction of the first maxillary premolars required the distal adjustment of the maxillary canines and incisors only. The mandibular second premolars presented rotations and severe linguoversion, whereas the mandibular first premolars were well positioned within the cortical plates and presented only minor rotations; furthermore, the removal of mandibular second premolars to match the removal of either first or second maxillary premolars sometimes provides a better interdigitation in the buccal segments than is obtained by removal of the mandibular first premolars.

#### FORMATION AND APPLICATION OF BANDS AND ATTACHMENTS

Bands are fitted to all teeth, including the second molars (Fig. 2). At the first sitting, seven to ten days following removal of the premolars, the maxillary and mandibular incisor and canine bands are fitted and cemented. Normally, in extraction patients, these twelve anterior bands may be properly fitted and cemented at this first visit without mechanical separation. Should

individual tight contacts impair the proper seating of one or two bands, these may be cemented at a later date. Brass wire separators are placed to facilitate fitting of second molar bands and premolar bands, and the patient is dismissed. At the next appointment the second molar and premolar bands are fitted and cemented, and separators mesial and distal to the first molars are replaced. At the third visit the first molar bands are fitted and cemented, and all brackets and sheaths are freed of all cement in preparation for placement of arch wires during the fourth appointment.

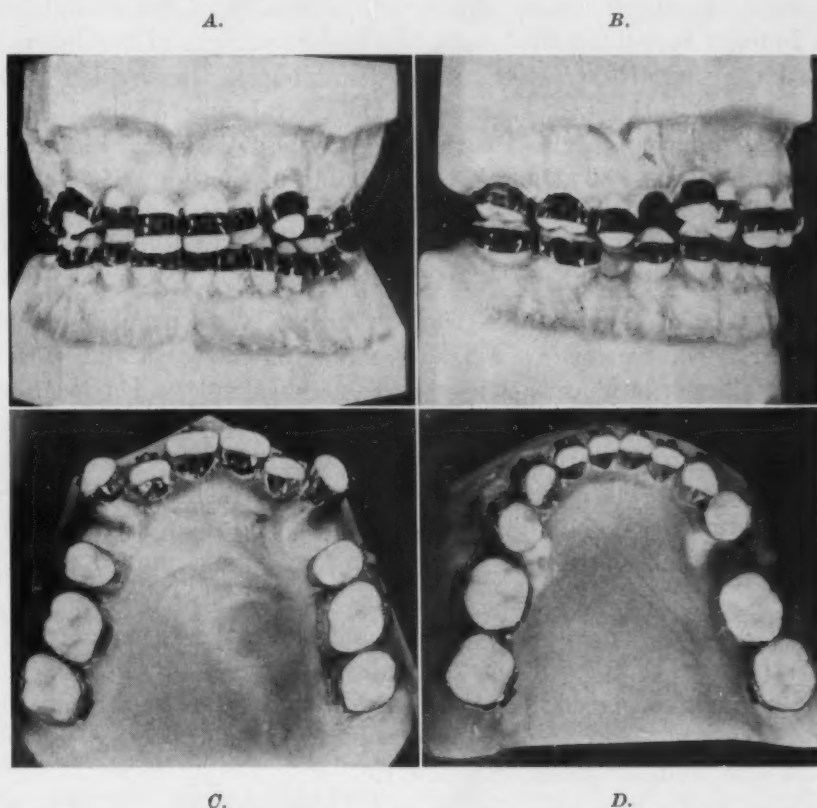


Fig. 2.—Proper positioning of bands and attachments. *A*, Front view. Note proper disto-axial inclination of central and lateral incisor brackets. *B*, Lateral view. Brackets of canines and mandibular premolars placed slightly distal to center of crowns of teeth. *C*, Brackets of maxillary premolars positioned slightly mesial to center of these teeth. Brackets of first molars centered on labial surface and eyelets placed mesial and distal to these brackets. *D*, Mandibular occlusal view. Note correct mesiodistal placement of lingual sheaths and molar sheaths on mandibular second molar bands.

Each band is adjusted at right angles to the long axis of the tooth, regardless of how badly the axial position of the tooth varies from normal, and all are fitted to occupy the middle third of the crowns in the gingivo-occlusal dimension. Bands are fitted to the teeth prior to the welding of the attachments to the band.

Single Victory type Universal brackets (UT 104) are utilized on all incisors, canines, premolars, and first molars. Multiple brackets are never used on a single tooth. Molar sheaths (UT 111) and lingual sheaths (UT 115) are attached to the second molar bands only.

A precise and exact location of the attachments on the bands is necessary for a harmonious finished result. Consequently, it is necessary to consider the precise location of the attachments on the bands and their relationship to the individual teeth being considered.

*Incisor Bracket Positioning.*—The brackets of the mandibular and maxillary incisors are welded to the bands in such a way that the midlines of the brackets are slightly mesial to the mesiodistal center of the labial surfaces of these teeth. In addition, they are attached with a slight distoaxial inclination to the long axis of the incisors. Precisely the incisal extremity of the mesial leg of the Victory bracket is welded flush with the incisal margin of the lateral incisor band, and the incisal extremity of the distal leg of the bracket is attached  $\frac{1}{64}$  inch gingival to the incisal margin of the lateral incisor band. The bracket of the central incisor is welded with a slightly less distoaxial inclination than for the lateral incisor. The specific positioning of these brackets is necessary to overcome the inherent tendency of the appliance to flare the incisors into an abnormal distoaxial position if the brackets are centered and placed in the true long axis of these teeth (Fig. 2, A).

*Canine Bracket Positioning.*—The canine bands are properly fitted to the middle third of the crowns. The band is seated on the tooth and, with a sharp instrument, a mark is placed on the band to indicate the exact location mesiodistally for placing the bracket. The brackets are welded perpendicularly with the incisal margin of the band, and the incisal extremity of the legs of the bracket is flush with the margin of the band. The brackets are placed slightly distal to the midline of the labial surface of the canine in order to prevent an adverse distolingual rotation of these teeth as they are moved distally (Fig. 2, B).

*Premolar Bracket Positioning.*—The brackets of the premolars are welded perpendicularly to the incisal border of the band. The maxillary second premolar attachment is placed slightly mesial to the labial midline of the tooth to compensate for the tendency to rotate in a mesiolingual direction while closing the first premolar space (Fig. 2, C).

The mandibular first premolar bracket is welded slightly distal to the labial midline in order to prevent an untoward distolingual rotation in its distal progress (Fig. 2, B).

*First Molar Bracket Positioning.*—A single Victory bracket is placed in the midline of the labial surface of the first molar perpendicular to and flush with the occlusal margin of the band, and eyelets are welded mesial and distal to the bracket in such a position that they will not interfere with the proper seating of the arch wires in the brackets (Fig. 2, D). These eyelets are ligated to the labial arch wires to prevent adverse rotations of the first molars during treatment or to correct any rotations that are present.

*Variations.*—The specific bracket positions just mentioned are utilized when the teeth to be banded present no appreciable rotations prior to treatment. If any of the teeth are rotated at the time of banding, the bracket is positioned mesially or distally in such a manner that the action of the labial arch wires will leave the individual rotations slightly overcorrected.

*Second Molar Sheath Positioning.*—Molar sheaths are attached to the buccal surfaces and lingual sheaths to the lingual surfaces of second molar bands.

The molar sheaths are welded to the band in such a way that the occlusal edge of the sheath lies parallel and flush with the occlusal edge of the band. They are placed so that their mesiodistal center is  $\frac{1}{16}$  inch mesial to the center of the buccal surface. The lingual sheaths are placed parallel to the occlusal edge of the bands on the lingual surface as far occlusally as the occlusion will allow without interference. Their mesiodistal center is placed  $\frac{1}{16}$  inch distal to the center of the lingual surface. This slight distal positioning of the lingual sheaths is necessary to assure sufficient access for insertion of the lingual arch wires (Fig. 2, D).

#### TREATMENT PROCEDURE, PHASE I

In a large majority of patients in whom extractions are not necessary, space for repositioning teeth is obtained by distal positioning of molars. This is accomplished in Phase I treatment. In patients requiring extractions, the needed space for repositioning of the teeth is gained by removal of teeth. Consequently, in the extraction case, Phase I is omitted and treatment is initiated with Phase II mechanics.

#### TREATMENT PROCEDURE, PHASE II

*Objective.*—The aim of this phase of treatment is to move the maxillary canines distolingually to contact the second maxillary premolars, and to move the mandibular canines and first premolars distally to establish normal contact of the first premolars and the mandibular first molars. A minimum disturbance of the anchor teeth (namely, the incisors, the molars, and the maxillary premolars) is essential in this phase of treatment. The gingival arch wires, when properly pinned and locked, maintain the incisor anchorage. The lingual arch and the Atkinson tangs, placed in the flat labial arch wires, maintain the molar anchorage.

*The Mandibular Double-Round Occlusal Arch Wires With Gingival Arch and Intersegmental Coils.*—Compound impressions of the maxillary and mandibular arches are taken for fabrication of lingual arches.

Utilizing a one-foot length of high-spring-tempered 0.010 inch round wire, one-fourth of the length is bent back upon itself after the wire is annealed at the point at which the bend is to be made. This folded end is inserted into the left mandibular molar sheath with the short segment gingival to the longer occlusal portion, allowing a  $\frac{1}{16}$  inch extension distal to the sheath. The double arch wire is settled into the brackets of the left side up to and including the left mandibular central incisor. Provisional pins are used where necessary to assure the proper seating in all these brackets. The short end of the wire is then bent gingivally to form a right angle stop at the mesial portion of the left central incisor bracket (Fig. 3, A). Seating of the incisal wire in the brackets of the right side is continued, and a mark is placed on the wire corresponding to the mesial aspect of the right molar sheath (Fig. 3, B). The arch wire is removed from the mouth and another mark is made distal to the first mark, indicating

the distal extent of the right molar sheath. At a distance  $\frac{1}{16}$  inch distal to this latter mark, the free end is bent back on itself in such a manner that it will form the right gingival portion of the double-round arch. The left central incisor stop is then finished by adjusting the bend to an exact right angle, and the free end is cut off  $\frac{1}{32}$  inch from the bend. The arch wire is replaced in

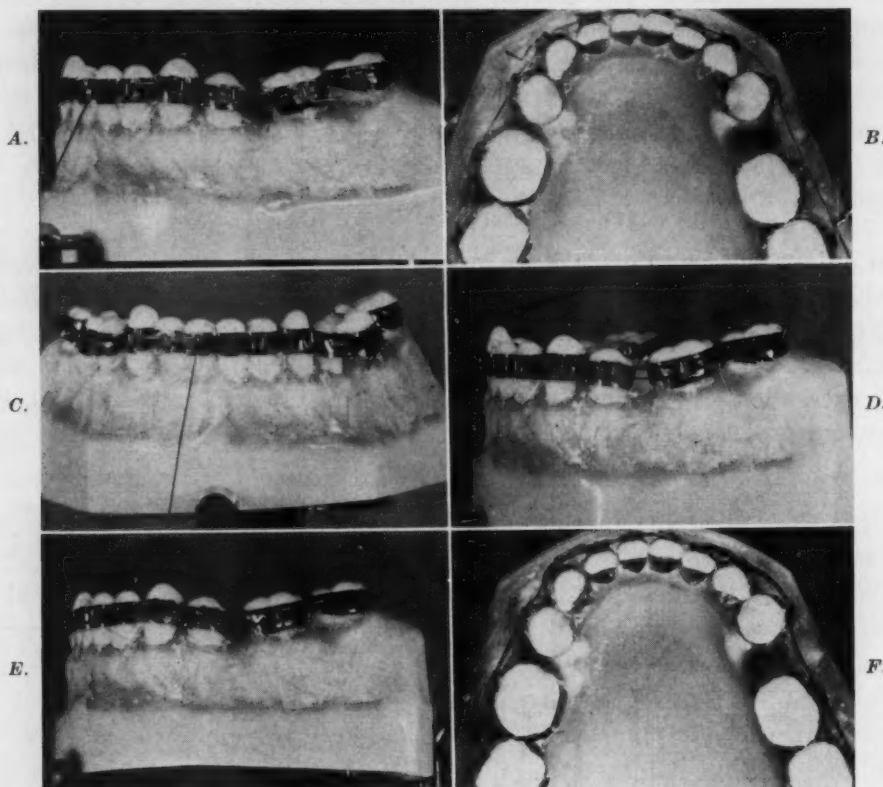


Fig. 3.—Phase II. Mandibular double-round occlusal arch wire with gingival and intersegmental coils. *A*, Arch wire seated into attachments of left side and gingival section bent at mesial end of left central incisor bracket. *B*, Occlusal portion settled into brackets of right side and mark placed on arch wire at mesial end of right molar sheath. *C*, Left incisor stop completed and double-round arch wire settled into all attachments. Gingival section bent at mesial end of right central incisor bracket. *D*, Occlusal and gingival arch wires pinned into brackets of left side except for canine. Intersegmental coil is passive. *E*, Coil compressed into intersegmental space and arch wires pinned into canine bracket. *F*, Completed mandibular double-round arch wire and gingival arch wire with intersegmental coils. Coils compressed and gingival arch wire locked.

the mouth with the provisional pins placed, as necessary, in the left side. The right folded end is then inserted into the molar sheath with this portion settled into the brackets of the right side in the same manner as that on the left. The stop should be in tight contact with the bracket of the left central incisor. The free end of the right gingival wire is bent to form a stop mesial to the right central incisor (Fig. 3, *C*). The wires are then teased from the right incisor brackets, leaving the provisional pin in the right canine. The right central incisor stop is completed by sharpening the bend to an exact right angle with the free end cut off  $\frac{1}{32}$  inch from the bend. The wires are then replaced into the right central and lateral incisor brackets.

A coil of sufficient length is cut so that, when fully compressed, a maximum number of turns will be incorporated into the left canine-lateral incisor embrasure. A similar coil is cut for the right side. (The coil is made of 0.008 inch spring wire wound open on 0.030 inch round wire.)

A 0.012 inch high-spring-tempered round wire is used for the gingival arch which has been previously formed to a No. 104 Hawley chart. The left end of this wire is curled in an occlusal direction and the end threaded through the gingival portion of the left molar sheath. The occlusal and gingival arches are pinned into the left molar and first premolar brackets. The left intersegmental coil is slipped onto the arch wire from the right end of this wire and positioned into the interproximal space between the left incisor and canine. The arch wires are pinned in the left lateral incisor bracket. The right intersegmental coil is slipped onto the gingival arch (Fig. 3, *D*). The left intersegmental coil is compressed in the left lateral incisor and canine interproximal space, and the arches are pinned in the canine bracket (Fig. 3, *E*). The right extremity of the gingival arch wire is curled in the same way as the left side and threaded into the gingival portion of the right molar sheath. The arch wires are pinned in the same way as they were on the left side, and the coil is compressed between brackets of the right lateral incisor and canine.

The left end of the gingival arch wire extending distal to the molar sheath is grasped and locked by bending it occlusally into the space between the distal extension of the occlusal arch wire and the molar band. The excess is cut off at the occlusal border of the double-round arch. The right distal extension is grasped and, by distal pressure, maximum tension on the entire gingival arch is obtained. The distal stop is then bent and the excess is cut off. Tension on the gingival arch is essential in order to prevent mesial migration of the incisors (Fig. 3, *F*).

*The Maxillary Preliminary Flat Occlusal Arch Wire With Contractile Gingival Canine Segments.*—The end of a one-foot length of 0.008 inch by 0.028 inch hard arch wire (UT 160) is folded back on itself, with the short end about  $\frac{3}{4}$  inch long, after the arch has been annealed at the point of the bend. The doubled end is inserted into the occlusal portion of the left molar sheath, the short end to the buccal side and the arch wire extending  $\frac{1}{16}$  inch distal to the sheath. The arch wire is seated into the left first molar and second premolar attachments, and a mark is placed on the wire corresponding to the position of the contact point of the first molar and second premolar. The arch wire is then removed and the left molar offset bend is formed at this mark (Fig. 4, *A*).

The arch wire is replaced into the left molar sheath and, progressing from left to right, the arch wire is settled into all the Victory brackets. Provisional pins are utilized if necessary. A mark is made on the arch wire opposite the contact point of the right premolar and first molar, and a second mark is made at the mesial side of the right molar sheath (Fig. 4, *B*). The arch wire is then removed from the mouth.

A third mark, the width of the molar sheath, is made distal to the mark indicating the mesial aspect of the right molar sheath. The free end is folded back buccally on itself  $\frac{1}{16}$  inch distal to the last mark after the point of the bend has been annealed. The right molar offset bend is made at the mark placed opposite the contact point of the right premolar and first molar in the same way as on the left side.

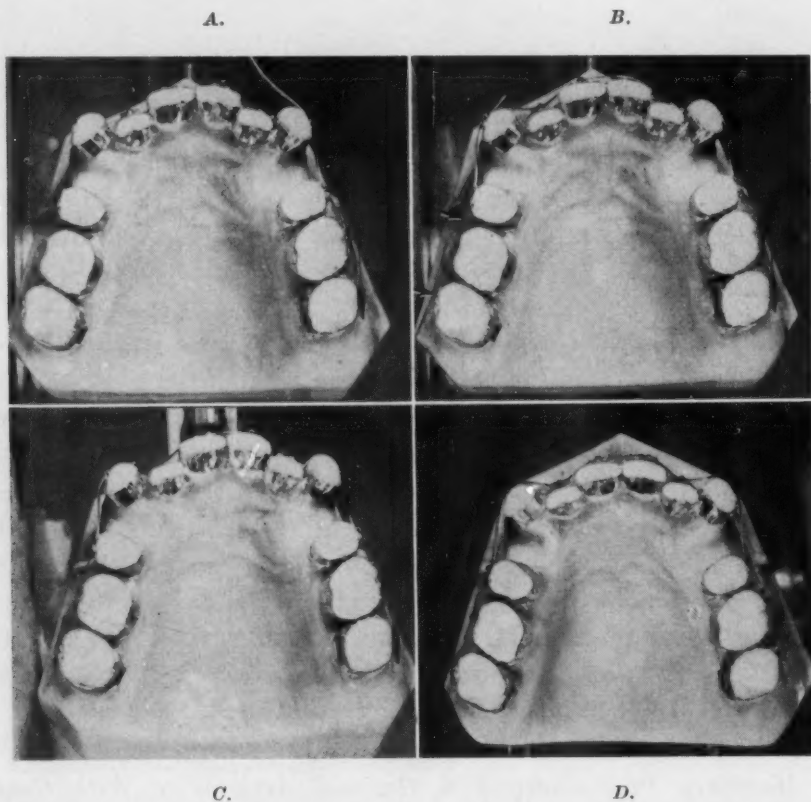


Fig. 4.—Phase II. Maxillary preliminary flat occlusal arch wire. A, Left end folded and left molar offset bend formed. Arch wire has been settled into the left molar, premolar, and canine attachments. B, Arch wire settled into all brackets. Mark made on arch wire opposite contact point of right premolar and first molar and second mark made at mesial end of molar sheath. C, Arch wire settled into all attachments, provisionally pinned, and arch wires centered. D, Free ends bent to buccal portion flush with mesial end of molar sheaths. Right side shows primary bend and left side completed Atkinson tang.

The arch wire is replaced into both molar sheaths and settled into all brackets. Provisional pins are placed wherever indicated to assure accurate seating of the arch wire in all attachments. The arch wire is centered so that the extensions distal to the molar sheaths are of equal length (Fig. 4, C). The free ends are bent to the buccal side in such a manner that the bend is flush with the mesial end of the molar sheaths (Fig. 4, D, right side). The arch wire is removed from the mouth and the Atkinson tangs are completed by adjusting this bend to an exact right angle and cutting off the free ends  $\frac{1}{32}$  inch from the bend. The cut ends are polished to prevent irritation to the buccal mucosa (Fig. 4, D, left side). The arch wire is bent to the appropriate Hawley chart and put aside until fabrication of the contractile gingival canine segments is completed.

A tight-wound coil is turned in a six-inch length of 0.010 inch high-spring-tempered wire, wrapping eleven turns on an 0.030 inch round wire core, utilizing the contraction spring winder UT 273 (Fig. 12, *B*). The two free ends are adjusted to lie in the long axis of the coil and both ends are in the same plane as they leave the spring. Two of these contractile segments are fabricated.

The preliminary flat occlusal wire is placed into the molar sheaths and the arch is settled into the attachments. The distal end of the right contractile segment is curled, and this end is threaded into the right molar sheath. The flat occlusal wire and the gingival segment are pinned into the right first molar and the second premolar brackets (Fig. 5, *A*). The portion of the contractile segment mesial to the coil is placed in the gingival portion of the canine bracket.

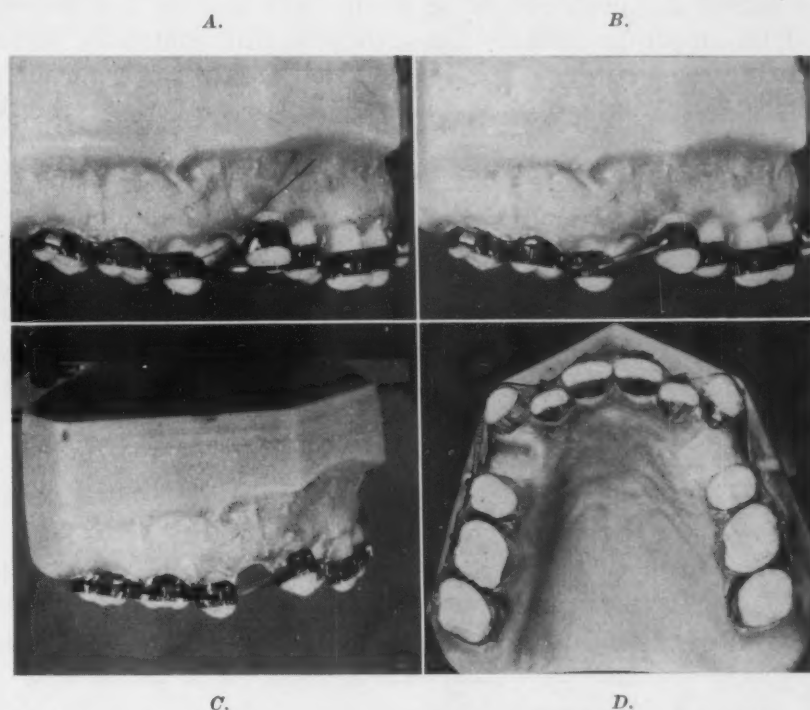


Fig. 5.—Phase II. Maxillary preliminary flat occlusal arch wire with contractile gingival canine segments. *A*, Contractile gingival canine segment and preliminary flat arch wire pinned into right second premolar and first molar brackets. *B*, Contractile segment and preliminary flat arch wire pinned into right canine bracket. Coil is passive. *C*, Contractile gingival canine segment activated and locked distal to molar sheath. *D*, Completed preliminary flat arch wire and contractile gingival canine segments.

The entire segment is then positioned forward to place the mesial end of the coil in close contact with the canine bracket, with the coil positioned so that the mesial free end of the segment lies in apposition with the floor of the gingival slot. The free end which traverses the gingival portion of the canine bracket is then bent to the incisal flush with the mesial portion of the bracket and then to the distal in the incisal slot. The canine pin is placed to engage the preliminary flat arch wire and the free end of the gingival segment in the incisal portion of the bracket and the gingival segment in the gingival slot (Fig. 5, *B*). Care must be exercised in cutting this gingival free

end flush with the bracket to prevent irritation to the buccal mucosa. The left gingival segment is placed in the same manner as the right. The flat arch is settled and pinned into the incisor brackets.

The contractile segment is activated by grasping the curled portion distal to the molar sheath and drawing it slowly in a distal direction until the contractile coil is stretched to twice its original length. While maintaining this tension, the arch wire is locked distal to the molar sheath by bending the free end at right angles in an occlusal direction between the extension of the flat arch wire and the molar band. The free end is cut off flush with the occlusal border of the preliminary flat wire. Both segments are activated in the same manner (Fig. 5, D).

The mandibular double-round arch wire with gingival and intersegmental coils and the upper preliminary flat arch wire with contractile segments are placed at the same sitting. The double-round arch wires are utilized as the primary arches, where possible, to minimize the shock of primary bracket leveling. They are replaced with preliminary flat arches as soon as this leveling occurs (within a month or two).

Because of the severe labial as well as mesioaxial position of the canines, it is necessary to reposition these teeth to a more favorable distolingual relationship by contractile segments before the placement of the more desirable gingival wire with intersegmental coils. The less severe double-round arch wires are not used with the contractile segments, since they offer a minimum of resistance to mesial migration of the buccal segments. It is necessary, therefore, to utilize a flat arch wire with Atkinson tangs in conjunction with the contractile canine segments. In placing the original flat arch wire without prior bracket leveling, pinning the arch wires in the more severely malaligned teeth would result in excessive stress being applied to these teeth. The gingival arch wire and the occlusal flat arch wire are ligated into the brackets of the severely malaligned teeth, only partially seating the flat arch wire into the incisal slot. At subsequent appointments these ligatures are tightened until brackets are leveled and these arches can be fully seated and pinned.

The patient is seen at two-week intervals, and the contractile segment is reactivated by grasping the distal extension of the gingival segment, tensing the coil, and relocking the segment to the molar sheath. The contractile segments are discarded, and gingival arch wires with intersegmental coils are placed as soon as canine position justifies this procedure. This minimizes the strain on the premolar and molar anchorage.

*The Preliminary Lingual Arch.*—The preliminary lingual arches are formed on the models prepared from the impressions taken at the previous sitting (Fig. 6, A). Using a six-inch length of 0.030 inch round, hard-tempered wire, a bend is made  $\frac{3}{4}$  inch from one end. The wire is annealed at the bend, and the end is folded parallel to and in contact with the long end. The folded section is firmly seated into the lingual arch lock former No. 93 (HW General) and the stop is completed by bending the extension to a 90 degree angle (Fig. 6, B). The excess is then cut off  $\frac{1}{32}$  inch from the bend and the stop is

polished. The arch wire is then bent as shown in Fig. 6, *C*. This is done, on the model, in such a manner that when the left lingual insert is superimposed over the left molar sheath the wire is free of the first molars (inset bands), the premolars, and the canines, and the mesial portion of the wire fits accurately at the linguogingival margin of the central incisors. A mark is then placed  $\frac{3}{32}$  inch distal to the distal extremity of the right molar sheath (Fig. 6, *C*). The lingual insert for the right molar sheath is made in the same way as that on the left side, using the mark as a guide for proper length (Fig. 6, *D*). The preliminary lingual arch wires are placed during the patient's next visit. The arches are adjusted so that they slightly overrotate the second molars mesio-buccally (Fig. 7, *A*). They are also adjusted to correct any buccolingual or mesiodistal inclinations (Fig. 7, *B*). The distance between the arch wire extremities is established by using the Erikson chart (Fig. 8). The properly

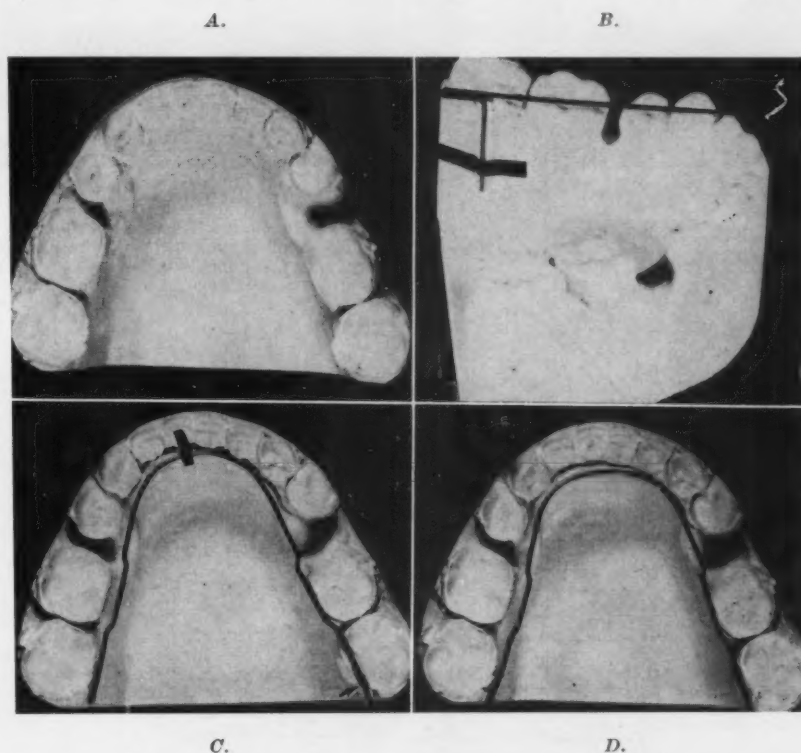


Fig. 6.—Phase II. Fabrication of mandibular preliminary lingual arch wire. *A*, Stone model for fabrication of preliminary lingual arch wire. *B*, Left insert folded and stop bent in a six-inch length of 0.030 inch round wire and insert superimposed on left lingual sheath. *C*, Lingual arch wire contoured and superimposed on model. Mark placed on arch wire to indicate correct length of right extremity. *D*, Completed preliminary lingual arch wire positioned on stone model.

adjusted arch wire is firmly seated into the lingual sheaths and ligated to one central incisor with a 0.012 inch steel ligature (Fig. 7, *D*). The maxillary and mandibular arches are placed during the same appointment. A minimum of two adjustments, preliminary and final, are necessary to attain correct molar relationship before proceeding to Phase III treatment. If rotations and buccolingual inclinations are severe, a third adjustment is sometimes indicated. The lingual arches are utilized throughout the entire Phase II treatment cycle.

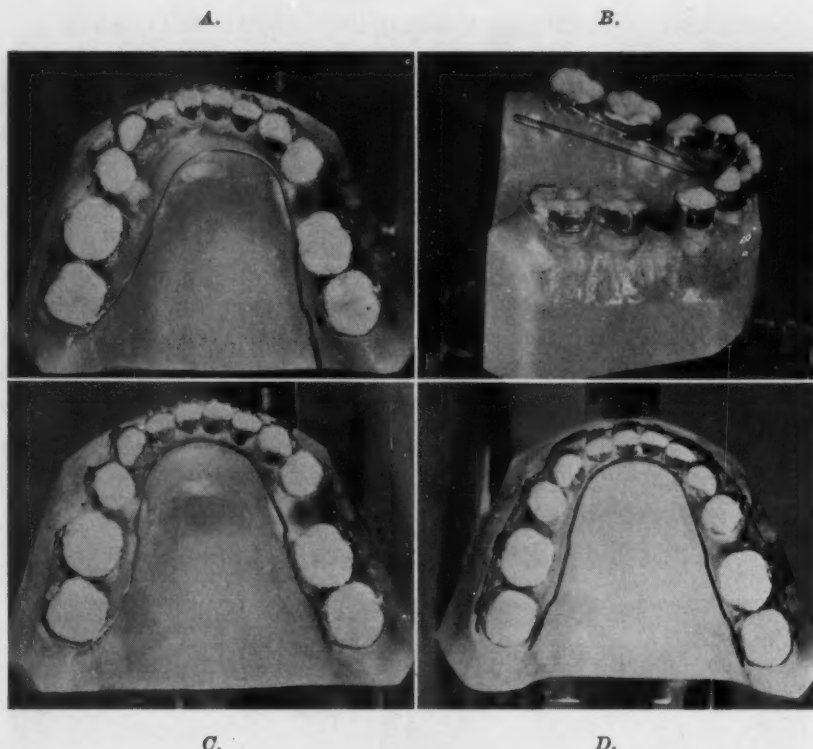


Fig. 7.—Phase II. Intraoral adjustments of preliminary lingual arch wire. A, Preliminary lingual arch wire adjusted for mesiobuccal rotation of left mandibular second molar and arch wire seated into lingual sheath. B, Preliminary lingual arch wire adjusted for mesiobuccal rotation and lingual torquing of the left mandibular second molar and arch wire seated into lingual sheath. C, Arch wire seated into molar sheaths following proper adjustments. D, Completed arch wire ligated to left mandibular central incisor.

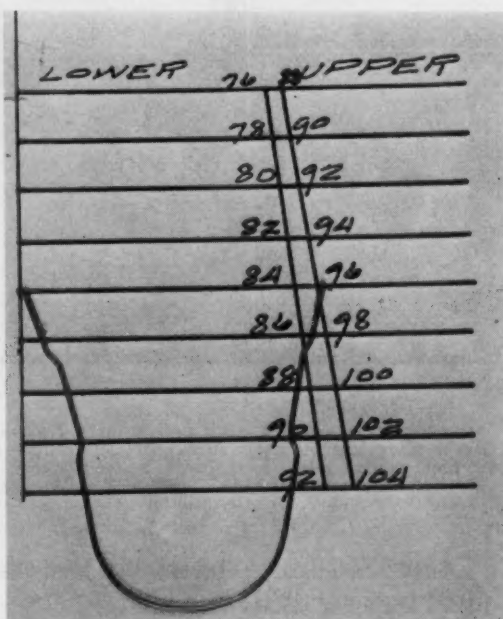


Fig. 8.—Erikson's lingual arch chart. Horizontal measurement from left vertical line to appropriate diagonal line determines correct dimension between first molar teeth. Left diagonal line is mandibular measurement and right diagonal line is the maxillary. Numbers correspond to numbers of Hawley charts. Since molar sheaths of extraction cases are placed on second molar bands, it is necessary to adjust arch wire four sizes larger to compensate for greater distance between second molar teeth. Maxillary arch wire illustrated is properly adjusted for a case measuring 88/76 by the Hawley standards, if lingual sheaths are attached to second molar teeth.

*The Maxillary Preliminary Flat Arch Wire With Intersegmental Coils.*—As soon as the maxillary canines present a favorable position for use of intersegmental coils, the contractile segments and original preliminary flat arch wires are removed and discarded. A new preliminary flat wire is constructed exactly as previously described to conform to the newly established arch form. This arch wire is seated into the maxillary molar sheaths and settled into the brackets, and a gingival 0.012 inch arch with intersegmental coils is fabricated and arch wires are pinned as described in the discussion of the mandibular double-round occlusal arch wires with gingival arch and intersegmental coils. In locking the gingival arch distal to the molar sheaths, it is essential to pull the wire snugly into all brackets (Fig. 9, A, B, C, and D).

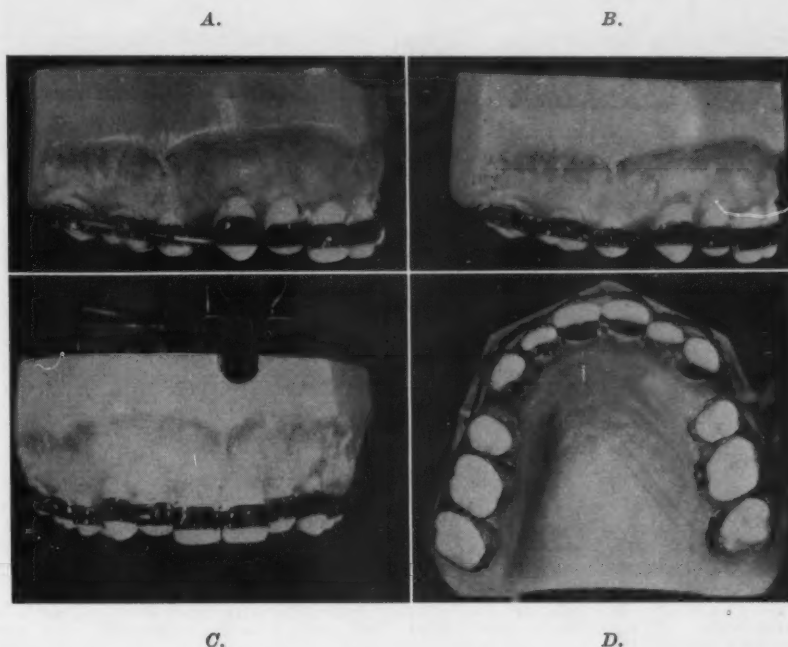


Fig. 9.—Phase II. Maxillary preliminary flat arch wire and gingival arch wire with intersegmental coils. A, Maxillary preliminary flat arch wire and gingival arch wire pinned into all brackets except the canine. Intersegmental coil is passive. B, Intersegmental coil compressed and arches pinned into canine bracket. Gingival arch wire has been locked. C, Anterior view of completed preliminary flat arch wire with gingival arch wire and intersegmental coils. D, Occlusal view of completed arch wires and activated intersegmental coils.

*The Mandibular Preliminary Flat Arch Wire With Gingival and Intersegmental Coils.*—As soon as bracket leveling has been accomplished with the mandibular double-round occlusal arch wire with gingival wire and intersegmental coils, these arch wires are discarded. A mandibular preliminary flat wire and a new gingival wire with intersegmental coils are fabricated and placed. The procedure for constructing the mandibular preliminary flat wire is identical with the procedure previously described for the maxillary preliminary flat wire. Placement of the arch wires proceeds in the same manner as placement of the double-round arch wire with gingival and intersegmental coils (Fig. 10, A, B, C, and D).

The patient is seen at four-week intervals, and the mandibular and maxillary intersegmental coils are checked for proper action and renewed as required. The maxillary canines are carried ahead of the mandibular canines to minimize interferences.

Phase II treatment is continued until the following requirements are accomplished: (1) normal contacts of the maxillary canines with the maxillary second premolars, (2) normal contacts of the mandibular first premolars with the mandibular first molars, and (3) the second molars are in correct axial and rotational position and the lingual arches are passive. When these requirements are completed, Phase IIIA may be begun.

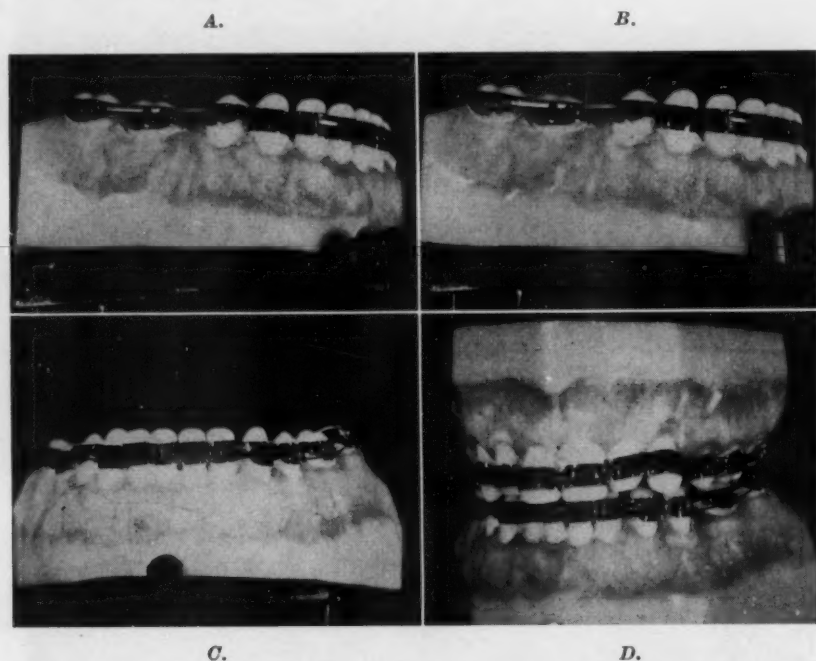


Fig. 10.—Phase II. Mandibular preliminary flat arch wire and gingival arch wire with intersegmental coils. A, Mandibular preliminary flat arch wire and gingival arch wire pinned into all brackets except the canine. Intersegmental coil is passive. B, Intersegmental coil compressed and canine bracket pinned. Gingival arch has been locked. C, Anterior view of completed mandibular preliminary arch wire with gingival arch and intersegmental coils compressed. D, Completed maxillary and mandibular preliminary flat arch wires and gingival arch wires. Intersegmental coils have been compressed and gingival arch wires locked.

#### TREATMENT PROCEDURE, PHASE IIIA

**Objective.**—In Phase IIIA treatment canines are retained in their newly established positions by ligatures. Mandibular and maxillary incisors are moved distally to restore lateral incisor-canine contacts. The lingual arch is removed during this phase of treatment, since it would prevent distal movement of the incisors.

**The Simple Flat Arch Wires With Contractile Gingival Arch Wires.**—Utilizing a one-foot length of 0.008 by 0.028 inch flat wire, a set-back bend is placed at the distal aspect of the left lateral incisor, and the wire is settled into the central and lateral incisor brackets. The arch wire is pulled so that this set-back bend lies flush with the distal surface of the left lateral incisor bracket, and the free end is bent to the buccal aspect so that it is flush with

the distal surface of the right lateral incisor bracket (Fig. 11, *A*). The arch wire is removed from the mouth, and the right lateral set-back bend is completed. The arch wire is settled into all attachments, and marks are placed on the wire at the mesial end of the molar sheaths and at the distal aspect of the premolar brackets (Fig. 11, *C*). The arch wire is removed from the mouth, and molar offset bends are formed so that they are flush with the distal surface of the premolar brackets and the ends of the arch wire are cut off, allowing  $\frac{1}{16}$  inch extension distal to the molar sheaths (Fig. 11, *D*). The arch wire is formed to the proper Hawley chart.

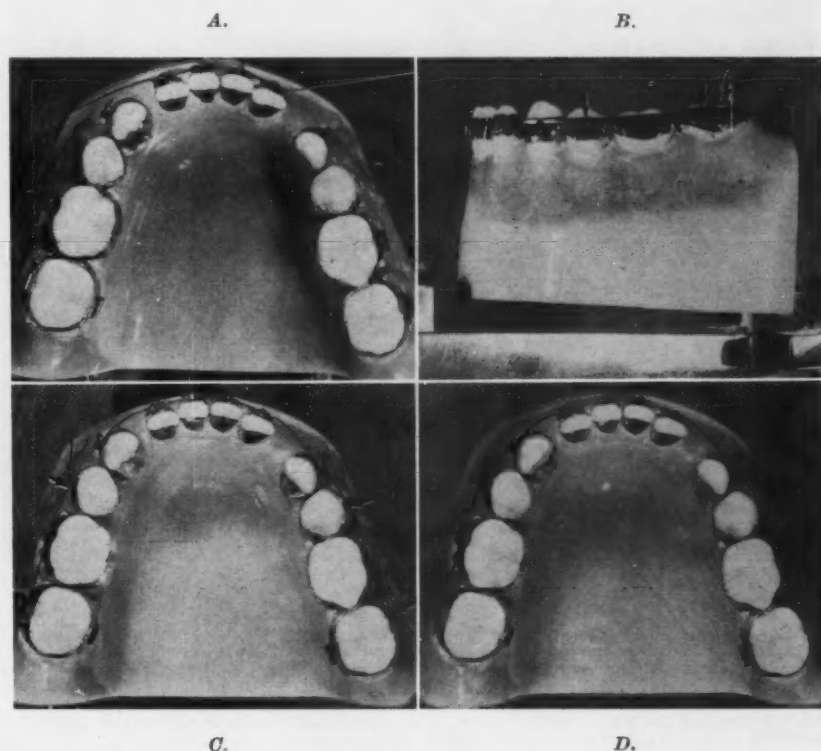


Fig. 11.—Phase IIIA. Simple flat arch wire. *A*, Left lateral incisor inset bend formed, arch wire seated into incisor brackets, and right free end bent flush with distal surface of right lateral incisor bracket. *B*, Arch wire seated into all attachments and marks placed at distal surface of first premolar bracket and mesial extremity of second molar sheath. *C*, Occlusal view showing proper location of marks on right and left segments of arch wire. *D*, Completed simple flat arch wire settled into all brackets. Note molar offset bends are flush with the distal surface of the premolar brackets.

A one-foot length of 0.010 inch high-spring-tempered wire is centered into the gingival slots of the incisor brackets, and provisional pins are placed to stabilize this segment. Bends are formed flush with the distal portions of the lateral incisors (Fig. 12, *A*). The arch wire is removed and the left bend is adjusted to form an exact right angle. The right bend is repositioned to bring it approximately  $\frac{1}{64}$  inch closer to the left bend and is then completed to form an exact right angle. The two extensions should be parallel to each other and in the same plane. The incisor segment is inserted into the contraction spring winder and the posts are adjusted to the bends. Two tight-wound coils of eleven turns each are made, and extensions are positioned in

the long axis of the coil (Fig. 12, *B*). The extensions are adjusted so that the incisor straight portion of the arch wire and the extensions join the coil in the same plane. The arch wire is then removed from the winder and the contractile gingival arch wire is bent to the approximate arch form, the coils being positioned on the outer aspect of the curve.

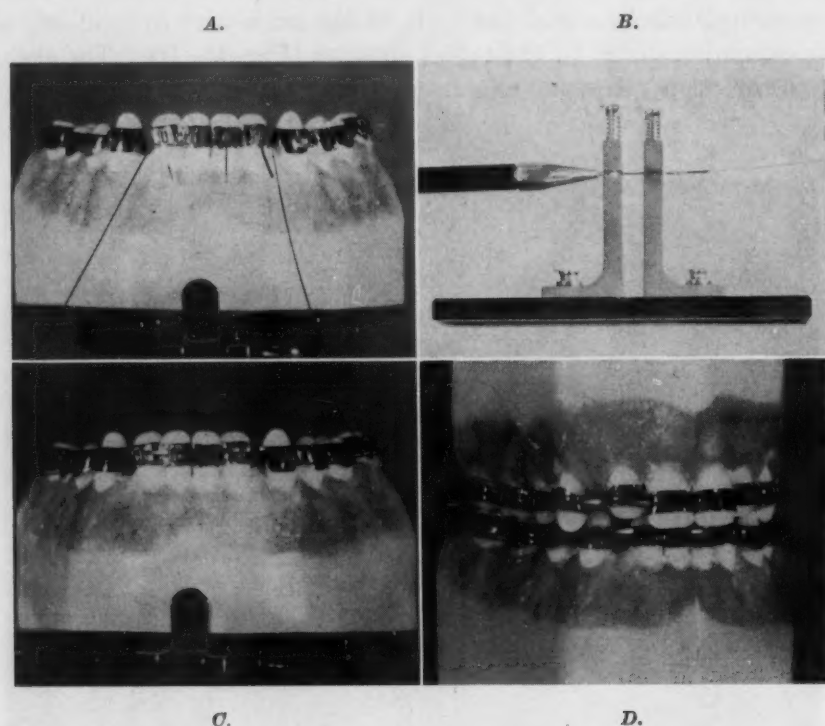


Fig. 12.—Phase IIIA. Contractile gingival arch wire. *A*, Gingival arch wire provisionally pinned into incisor brackets and bends made flush with distal extremities of lateral incisor brackets. *B*, Coils wound on contraction spring winder utilizing 0.030 inch core. Each coil has eleven turns. *C*, Simple arch wire settled into all attachments. Contractile gingival has been centered and both arches pinned into lateral incisor brackets. *D*, Completed simple flat arch wires and contractile gingival arch wires. Canine-molar tie-back ligatures have been placed and contractile gingivals activated and locked distal to molar sheaths.

The ends of the simple flat arch wire are inserted into the molar sheaths and the arch wire is settled into the brackets. The ends of the contractile gingival arch wire are curled and threaded into the molar sheaths, and the arch wire is settled into the gingival slots. The left lateral incisor is pinned first, then the right lateral incisor. The incisor portion of the arch is seated so that the coils lie flush with the distal surface of the lateral incisor brackets (Fig. 12, *C*). Pinning is continued until all brackets have been secured. Medium pins are used in the canine brackets. The canine is ligated to the second molar by inserting a 0.010 inch steel ligature through the canine bracket and continuing this ligature distal to the molar sheath and lingual to the occlusal arch extension and twisting the ends snugly but not too tightly. The cut end is folded into the canine premolar embrasure. Both buccal segments are ligated in a similar manner.

The contractile gingival arch wire is activated by grasping the extension distal to the molar sheath and drawing it slowly in a distal direction until the contractile coil is stretched to twice its original length. While maintaining this tension, the arch wire is locked distal to the molar sheath by bending the free end in an occlusal direction between the extension of the simple flat arch wire and the molar band. The free end is cut off flush with the occlusal border of the simple flat arch wire. The procedure is repeated for the opposite side (Fig. 12, *D*).

The contractile coils are reactivated at two- or three-week intervals until normal lateral-incisor canine contact is established. It is imperative that the simple flat arch wire be free to move distally through the molar sheaths throughout this phase of treatment. At each visit the molar offset bends are observed to ascertain that they are not contacting the molar sheaths and interfering with distal progress. Precise placement of the molar offset bend, flush with the distal surface of the premolar bracket as noted previously, is necessary to allow a maximum distal movement without molar sheath interference. If contact should occur before completion of space closure, the simple flat arch wire is removed and a new one fabricated. At each appointment the distal extension of the flat arch wire is observed for impingement on the gingival tissues. The ends of the wire should be cut off as necessary.

The maxillary and mandibular simple flat arch wires and contractile gingival arch wires are identical except for the lateral incisor inset bends. In the mandibular arch, the insets are made distal to the lateral incisors only, whereas in the maxillary arch additional compensating bends are made distal to the central incisors to complete the insets.

In Phase IIIA and subsequent treatments the mandibular adjustments precede the corresponding adjustments in the maxillary arch. Failure to observe this rule may result in an incisor cross-bite.

As soon as definite contact is re-established between the lateral incisors and canines, the tie-back ligatures are discarded and the contractile coils are relieved of all tension. Allowing continuous tension to remain in these coils will result in crowding of the incisors and canines and severe rotation of the second molars. Peculiarly, it may even lead eventually to a cross-bite in the buccal segments.

A compound impression is taken to include the lingual surfaces of all the teeth in order to obtain models for fabrication of the standard lingual arch wires.

#### TREATMENT PROCEDURE, PHASE IIIB

*Objective.*—Since it was necessary to remove the lingual arches in Phase IIIA, the second-molar positions have become disturbed. These molars must be repositioned in their desired rotational and buccolingual positions by use of standard lingual arch wires.

The standard lingual arches are constructed of 0.030 inch round wire and contoured as illustrated in Fig. 13, *D*. Axial and rotational discrepancies are

corrected by adjustments, as illustrated in Fig. 13, *A*, *B*, and *C*. The arch wire is adjusted to the exact dimensions between the extremities as determined by the Erikson chart (Fig. 8).

Initial and final adjustments are required, and sufficient time must be allowed for the final adjustment to become passive before proceeding with Phase IIIC. The anterior portion is ligated to one of the central incisors, as illustrated in Fig. 13, *D*. After the arch is passive following the final adjustment, it is not ordinarily disturbed again during the balance of the time that the patient is being treated.

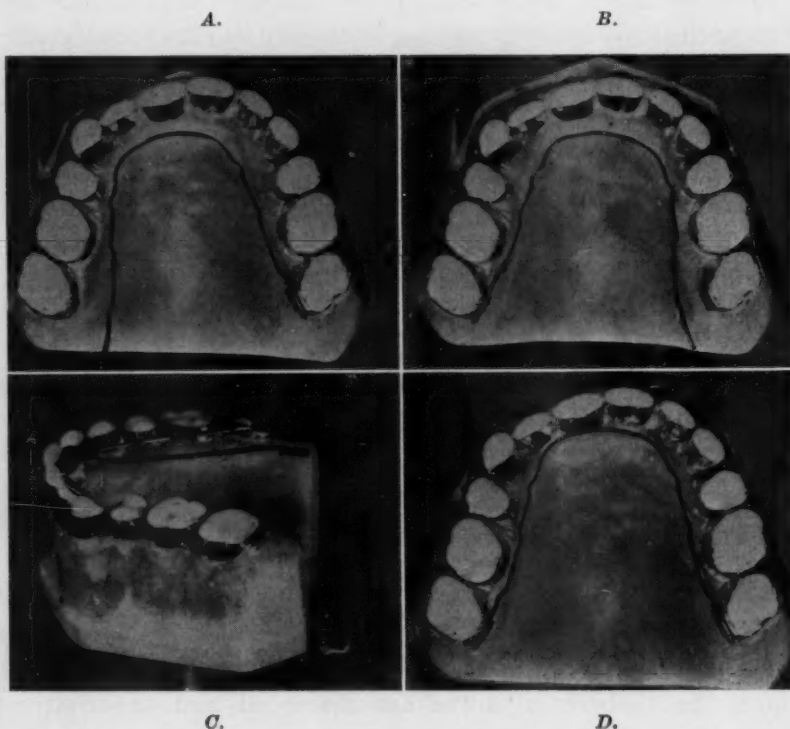


Fig. 13.—Phase IIIB. Adjustments of standard lingual arch wire. *A*, Standard lingual arch wire adjusted for mesio Buccal rotation of maxillary left second molar and inserted into molar lingual sheath. *B*, Standard lingual arch wire adjusted to rotate maxillary right molar mesio Buccally and inserted into molar lingual sheath. *C*, Maxillary standard lingual arch wire adjusted for mesio Buccal rotation and lingual torque of left second molar and arch wire seated into molar lingual sheath. *D*, Maxillary standard lingual arch adjusted for correct rotation and torquing of second molars, correct distance between the extremities established on the Erikson chart, and then seated into molar lingual sheaths. Ligation of the arch wire to right maxillary central incisor is shown.

#### TREATMENT PROCEDURE, PHASE IIIC

**Objectives.**—The objectives of this phase of treatment are to correct the overbite and the axial positions of the canines and premolars.

The contractile gingival arch wire is removed and discarded. The simple flat arch wire is utilized in Phase IIIC and modified as follows: The flat arch wire is carefully removed and recontoured to arch form. The ends are replaced into the molar sheaths, and the arch wire is settled into all brackets. Marks are placed exactly at the distal surface of the canine bracket and the mesial surface of the premolar bracket (Fig. 14, *A*). The arch wire is removed

from the mouth, and the body of the wire is grasped in the 0.008 by 0.010 inch slot of the pliers (H. G. General #73). The pliers are positioned so that the mesial face of the pliers is  $\frac{1}{64}$  inch distal to the premolar mark. The mesial portion of the wire is bent in a gingival direction to form the premolar portion of the step. The wire is then grasped so that the mesial portion of the beak of the pliers is flush with the canine mark, and the mesial section of the wire is bent in an incisal direction. In this manner, steps are formed in the arch wire on both sides (Fig. 14, *B*). The steps are adjusted so that right and left are of equal length, and the bends are equalized so that buccal segments and the steps lie in the same horizontal plane and the plane of the incisal-canine portion is gingival to and parallel to the buccal segments. The lateral-incisor and molar insets are not disturbed. This arch wire is formed to the appropriate Hawley chart.

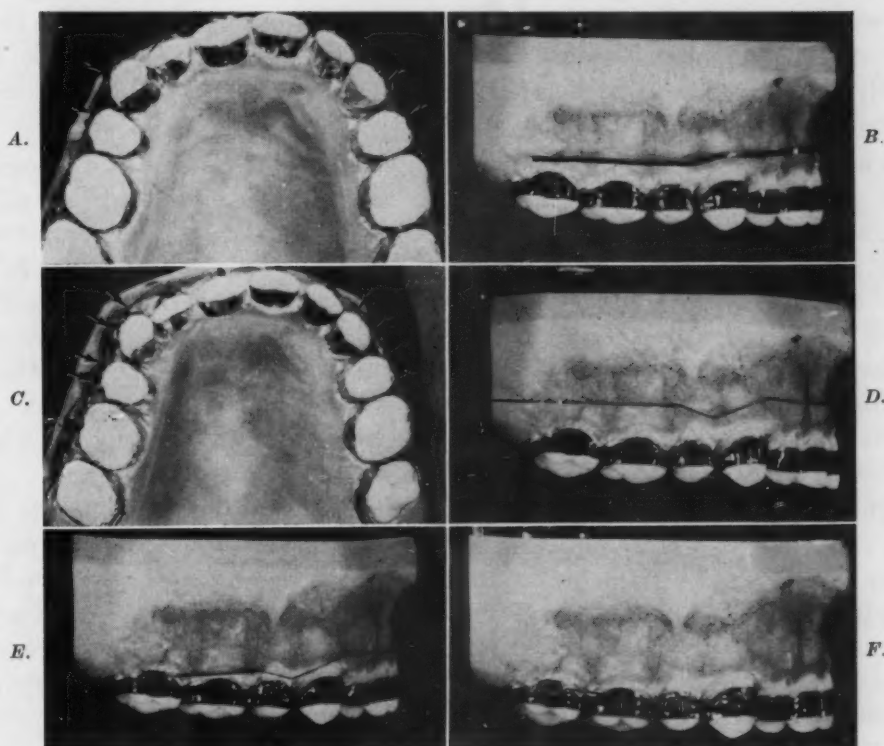


Fig. 14.—Phase IIIC. Simple flat arch wire with steps, and gingival arch wire with tent bends. *A*, Simple flat arch wire settled into all attachments and marks placed at the exact distal portion of canine brackets and at the mesial portion of premolar brackets. *B*, Step formed in simple flat arch wire occupying the canine-premolar embrasure. *C*, Lateral inset bends formed in gingival arch wire. Arch wire settled into brackets, and centered, and marks placed mesial and distal to canine and premolar brackets. *D*, Tent bend formed. Anterior leg to engage canine bracket and posterior leg to engage premolar bracket. *E*, Simple flat arch wire with steps and gingival arch wire with tent bends inserted into molar sheath. *F*, Simple flat arch wire with steps and gingival arch wire with tent bends seated into all attachments, pinned in all brackets, and gingival arch wire locked.

**Gingival Arch With Tent Bends.**—With a 0.012 inch gingival arch, pre-formed to the 104 Hawley chart, the lateral incisor inset bends are formed in such a manner that the bends will lie  $\frac{1}{32}$  inch distal to the brackets of both lateral incisors. This arch is then placed into the gingival portions of the

incisors, canines, and premolars, with provisional pins placed as indicated. The arch wire is centered and marks are placed on the arch wire so that they correspond to the mesial and distal surfaces of the canine brackets and the mesial and distal surfaces of the premolar brackets (Fig. 14, C). The arch wire is then carefully removed from the mouth. The wire is grasped in a pair of Goslee pliers; the first bend is made mesial to the mesial canine mark, and the mesial portion is bent in an incisal direction. The second bend is made at the mesial premolar mark in an opposite direction to the first. The third bend is made slightly distal to the distal premolar mark in the opposite direction of the second bend.

In extraction cases there is a tendency for the canines to be tipped distally and the premolars mesially in the space closure. The gingival bends are placed to correct these discrepancies. In addition, the incisor segment lies gingival to the buccal segments to harmonize with the steps in the simple flat arch wire for correction of the overbite, this change of level between the incisal segment and the buccal segment is accomplished by placing the first bend slightly mesial to the mesial canine mark, thus giving a mesial slope in the tent bend which is somewhat longer than the distal slope (Fig. 14, D).

The ends of the gingival arch wire are curled and threaded into the second molar sheaths, and the simple flat arch wire with steps is settled into all the attachments (Fig. 14, E). The arches are pinned in the left canine and right lateral incisor brackets. They are centered by using the respective lateral insets as guides. The right canine and the remaining incisor brackets are pinned. While the premolars are being pinned, the simple flat arch wire must be seated firmly into the occlusal slot of the bracket and held while the pin is being placed to ensure proper seating. The first molars are pinned. The gingival arch should not be locked at this time, but the patient must return for this locking one week later.

This one-week delay permits recovery from the distortion of the arch wires resulting from the pinning of the steps. It is imperative that the patient return in one week, at which time the pins of the premolars are removed and new pins placed in these brackets to ensure that the flat arch is fully seated into these brackets. The gingival arch wire is then locked at the extremities as previously described, making certain that the arch wire is snug in all brackets (Fig. 14, F).

Failure to lock the gingival arches in one week will result in spaces opening distal to the canines as a result of the steps. Spaces will likewise develop if the gingival wire is not locked tightly.

A minimum of two months is allowed for the teeth to adapt to these arch wires before proceeding to Phase IV treatment.

#### TREATMENT PROCEDURE, PHASE IV

*Objectives.*—Corrections of the intra-arch tooth positions and establishment of maximum anchorage for intermaxillary elastics, if required, are the objectives of this final phase of active treatment.

*Standard Flat Occlusal Arch Wire and Gingival Arch Wire With Tent Bends.*—Lateral incisor inset bends are placed in a one-foot length of 0.010 by 0.028 inch wire, as described previously. The arch wire is settled into the incisor, canine, and premolar brackets. Marks are placed on the wire corresponding to the mesial portion of the premolar brackets and the distal portion of the canine brackets (Fig. 15, *A*). The wire is then removed from the mouth and steps are formed distal to the canines, as described previously for steps in the simple flat arch wire. The arch is settled in the brackets and marks are placed at the mesial end of the molar sheaths and at the contact point of the molar and premolar (Fig. 15, *B*). The arch wire is removed from the mouth and the molar offset bends are formed. A mark is placed indicating the distal end of the molar sheath and, with this mark serving as a guide, the free end of the arch wire is bent buccally  $\frac{1}{8}$  inch distal to the molar sheath.

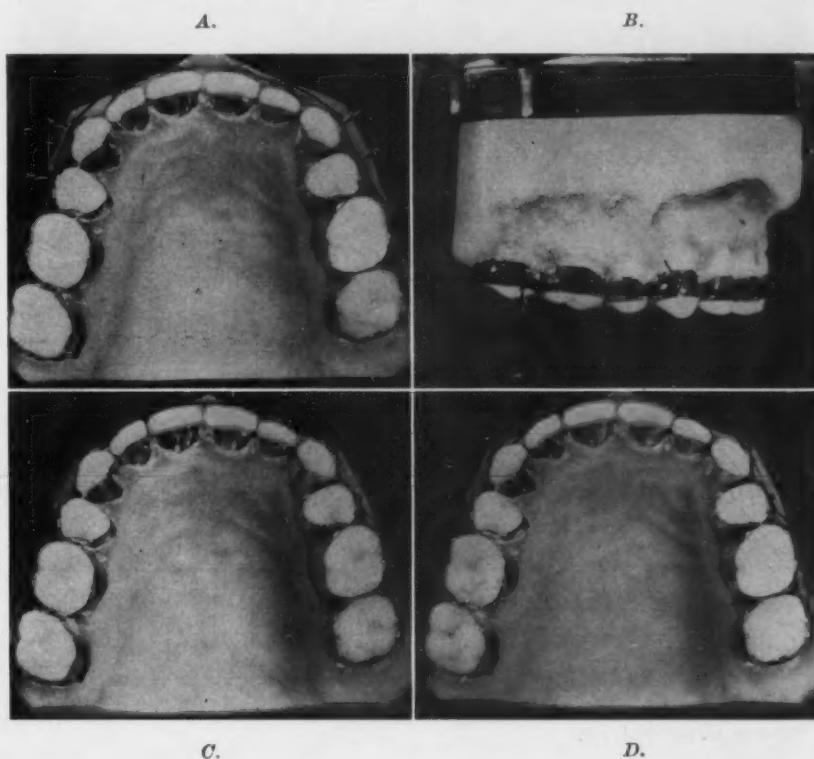


Fig. 15.—Phase IV. Standard flat arch wire. *A*, Lateral incisor inset bends made, arch wire settled into brackets, and marks placed at mesial end of premolar brackets and distal portion of canine brackets. *B*, Steps formed, and arch wire settled and pinned provisionally into canine and first molar brackets. Marks placed at premolar-first molar embrasure and at mesial end of molar sheath. *C*, Steps, molar offset bends, and folded ends of arch wire completed and arch wire seated into all attachments and centered. *D*, Free ends bent flush with mesial extremity of molar sheaths in order to form Atkinson tangs.

The bend is annealed and the free end is folded to contact the body of the arch wire. Care must be exercised in making this bend to ascertain that the free end is in true long axis and in good apposition with the main arch wire. If the fold is inaccurate, the doubled 0.010 inch arch wire cannot be inserted into the occlusal portion of the molar sheath. The arch wire is replaced in

the molar sheaths and brackets, provisional pins are placed to seat it accurately, and Atkinson tangs are constructed as described in the discussion of fabrication of preliminary flat wires (Fig. 15, *C* and *D*). The arch is formed accurately to the appropriate Hawley chart.

The gingival arch with tent bends used in Phase IIIC, if carefully removed, may be utilized in Phase IV. It is recontoured to remove any distortions and formed exactly to the appropriate Hawley chart.

The arches are pinned in the brackets in the same sequence as described for Phase IIIC. The gingival arches are locked at the same sitting, since there is no distortion of these arches at the steps as was present in Phase IIIC (Fig. 16, *A*, *B* and *C*).

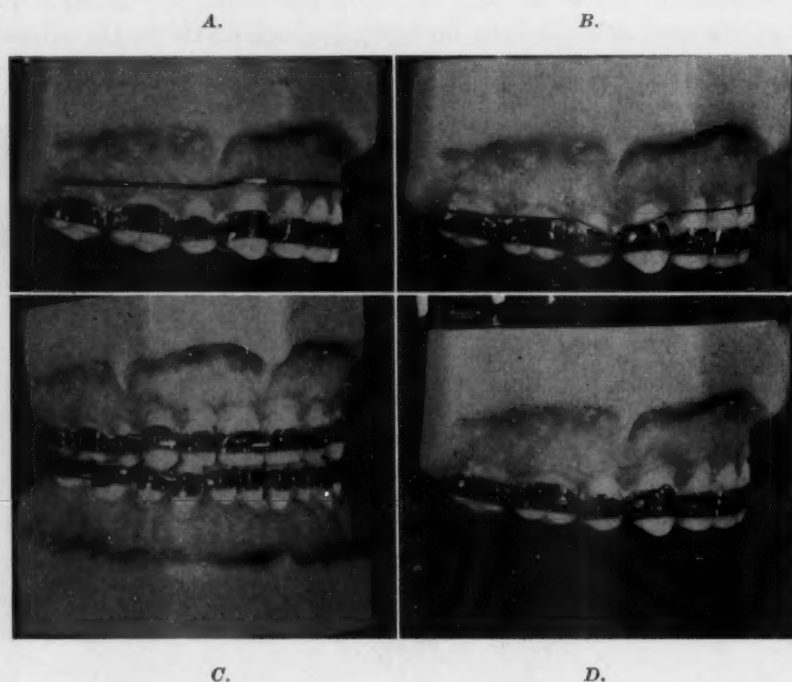


Fig. 16.—Phase IV. Standard flat arch wire and gingival arch wire with tent bends. *A*, Completed standard flat arch wire with steps and Atkinson tangs. *B*, Completed standard flat arch wire with steps and gingival arch wire with tent bends. *C*, Completed maxillary and mandibular standard flat arch wires and gingival arch wires with tent bends. Arch wires are pinned and locked. *D*, Hook for attachment of elastics placed into canine bracket. This is formed from a large lock pin.

The patient is seen in four weeks, at which time a careful examination is made of the intermaxillary relationship. If intermaxillary discrepancies are present, hooks for correction of these discrepancies are made and the elastic therapy begins. These hooks are fabricated from large pins as illustrated in Fig. 16, *D*. For the correction of Class II discrepancies, hooks are placed on maxillary canines and the elastics are placed from these hooks to the distal extension of the mandibular standard flat arch wires. Midline discrepancies are corrected by diagonal elastics from hooks placed in the lateral incisor brackets, and cases of anterior open-bite are treated with up-and-down elastics between lateral incisor hooks.

In this specific case report no intermaxillary correction is indicated; therefore, the standard flat arch wire and the gingival arch with tent bends are allowed to remain undisturbed for a minimum of two months after they are passive. Active appliances are removed during the next appointment and impressions are taken for fabrication of retainers (Fig. 17, *A*, *B*, *C*, and *D*).

*Retention.*—Hawley retainers, modified according to Atkinson, are made and placed as soon as possible. Usually these retainers are worn night and day for six months and subsequently only at night. The patients are instructed to continue this night wear until the third molars have erupted.

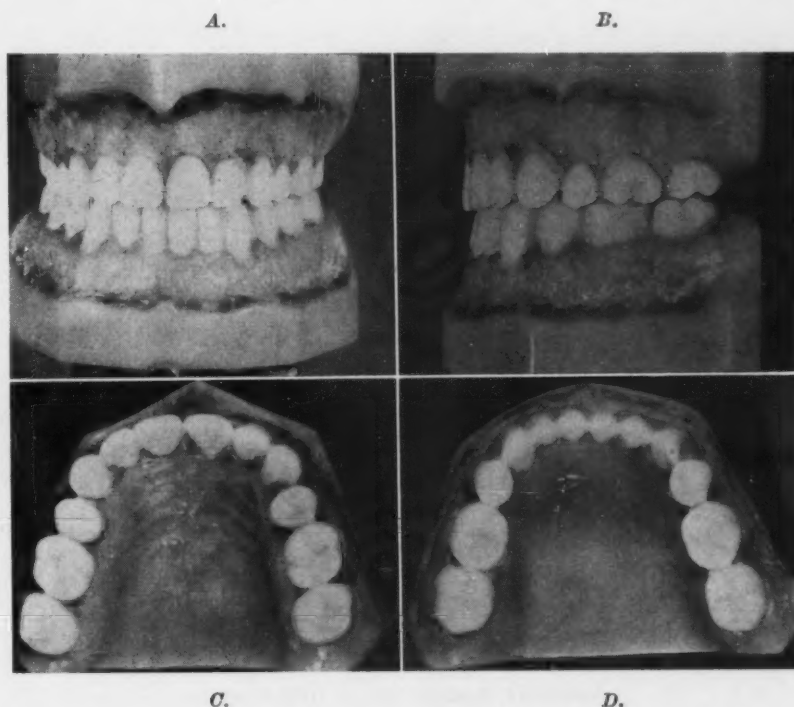


Fig. 17.—Models of patient after treatment. *A*, Front view. *B*, Left lateral view. *C*, Maxillary occlusal view. *D*, Mandibular occlusal view.

#### SUMMARY AND CONCLUSIONS

I have attempted to describe the clinical application of the Universal appliance, as formulated by Dr. B. Edwin Erikson and clinically tested by him for an eighteen-year period in the treatment of patients requiring extraction of four premolars. I realize that it is impossible in a single article to present all of the technical details in appliance therapy without the medium of clinical demonstration. Nevertheless, an effort has been made to record sufficient detail of technical procedures so that others, if they desire, might utilize the appliance that in my limited clinical experience has proved so valuable.

The author gratefully acknowledges his indebtedness to Dr. B. Edwin Erikson for the privilege of being permitted to record his technique. Acknowledgment is also made to the Medical Illustrations Section of The Armed Forces Institute of Pathology for preparing the photographs used in this paper.

## REFERENCES

1. Atkinson, Spencer R.: The Strategy of Orthodontic Treatment, J. A. D. A. and Dental Cosmos 24: 560-574, 1937.
2. Erikson, B. Edwin: Simultaneous Distal Movement of Maxillary and Mandibular Buccal Segments, AM. J. ORTHODONTICS & ORAL SURG. 28: 82-96, 1942.
3. Erikson, B. Edwin (Consultant to the Orthodontic Section, Dental Service, Walter Reed Army Hospital): Personal instructions received on Friday mornings from April, 1953, until time of writing.
4. Day, William H.: Erikson's Technique With the Universal Appliance, AM. J. ORTHODONTICS 37: 727-750, 1951.

---

**Plan Now to Attend  
1958 Meeting**

**American Association of Orthodontists  
Commodore Hotel, New York City  
April 27-May 1, 1958**

On page 309 you will find an announcement concerning registration of members, associate members, and guests. Please read it carefully and act immediately.

Reservations for rooms should be sent directly to the Commodore Hotel, New York City. A full program of entertainment for the ladies has been prepared. New York is waiting for you.

## RELATION OF THE NASAL AND SUBNASAL COMPONENTS OF FACIAL HEIGHT IN CHILDHOOD

HOWARD V. MEREDITH, PH.D., VIRGINIA B. KNOTT, PH.D., AND  
ERNEST H. HIXON, D.D.S., M.S., IOWA CITY, IOWA

THE need for more ontogenetic research on the form of the human face can be shown by juxtaposing three pairs of conflicting statements drawn from general discussions of facial development: "After completion of the deciduous dentition there is no marked change in the proportion of the face"<sup>1</sup>; "Many adolescents find themselves gazing into the mirror at a face that is temporarily out of proportion."<sup>2</sup> "The proportions of any face, as far as vertical height is concerned, are constant throughout life"<sup>3</sup>; "The upper part of the face usually develops faster than the lower."<sup>4</sup> "Growth is an orderly process maintaining a constant proportionality within the face"<sup>5</sup>; "The nose matures earlier than other body parts, distorting facial proportions."<sup>6</sup>

This report pertains to one aspect of facial shape or form—the relation between the nasal and subnasal components of facial height. The following index is used:

$$\frac{\text{Nasal Height (distance from nasion to anterior nasal spine)}}{\text{Subnasal Height (distance from anterior nasal spine to menton)}} \times 100$$

Employing this skeletal percentage relation, we have made an analysis of longitudinal data extending over the childhood period from the ages of 4 to 12 years.

### OBJECTIVES

In discussing the aims or objectives of the study, we have used the word *index* to symbolize "nasal height expressed as a percentage of subnasal height." Major aims are as follows:

1. To investigate the mean trend of the index with particular reference to its direction during the childhood years and its magnitude at different ages. Is the mean index at successive ages constant, yielding a horizontal trend? If not, how much change occurs and what is the course of the mean index on age?
2. To investigate similarities and dissimilarities among individual index curves extending over an eight-year period of childhood. How homogeneous are the curves for individuals with respect to amount of index change? Is there diversity warranting the formation of subgroups on the basis of type of trend?

Supported in part by a research grant, D-217, from the National Institute for Dental Research, the National Institutes of Health, United States Public Health Service.

3. To investigate the dispersion of the index at biennial ages from 4 to 12 years. Are the indices for children at 4 years of age clustered near the mean or widely scattered? Does variability increase, remain constant, or decrease with advancing age?

4. To investigate whether certain orthodontic "bite-opening" procedures influence the index. Do the index curves of patients receiving special types of therapy show alterations associated with treatment?

#### SUBJECTS AND DATA

The data for nasal height and subnasal height were obtained from normal lateral roentgenograms accumulated in the Facial Growth Study.\* Acceptance in this study was dependent upon the probability of continued cooperation, and not upon dental or orthodontic condition. The resulting sample is a group of American-born white children, predominantly of northwest European ancestry and above average socioeconomic status.

All subjects in the study were included if roentgenograms were available at successive annual ages from 4 to 12 years and if orthodontic treatment had not been introduced. There were fifty-five such series, twenty-seven for boys and twenty-eight for girls. In addition, a supplementary group of seven subjects was used. This group consisted of those children in whom orthodontic "bite-opening" procedures could have produced an experimental increase in subnasal height.

Roentgenograms of the head were obtained routinely at each examination. The head was held by the Higley<sup>11</sup> positioner in such a manner that the central ray traveled at right angles to the midsagittal plane of the head. Subjects were instructed to bring their upper and lower posterior teeth into occlusion.

For most subjects there were satisfactory roentgenograms taken within a few days of the nine consecutive birth anniversaries from the age of 4 years to the age of 12 years. In the instances in which a film was missing or unsatisfactory for use, it was possible to utilize films obtained six months on each side of the birth anniversary (values were derived by measuring both films and averaging the two index results).

Three roentgenographic landmarks were employed: nasion (N), the tip of the anterior nasal spine (ANS), and menton (M). The procedure involved locating one landmark on the complete series of films for a single subject and marking it by piercing the films with a sharp needle probe. This process was repeated on each subject, and for successive landmarks, in order to maximize the precision and age-to-age comparability of the measurement termini.

The distance from N to ANS (nasal height) and the distance from ANS to M (subnasal height) were measured independently by at least two workers. Readings estimated to the nearest 0.1 mm. were made with a steel millimeter tape. When the results from two independent readings differed by 0.2 mm. or less, they were averaged. In instances of greater difference a third person

\*A long-term research program begun at the State University of Iowa in 1946 under the joint sponsorship of the Department of Orthodontics and the Child Welfare Research Station.

measured, and the three results were averaged (except that one reading was discarded in the event it was an obvious misreading). It was necessary to make a few adjustments in subnasal height for slightly incomplete occlusal contact.

Two further notations are relevant: First, the index under study has biologic validity without correcting nasal height and subnasal height for roentgenographic enlargement.<sup>14</sup> Second, the index under study relates one component of facial height to a separate component, thereby avoiding the confounding which occurs when a component is related to a composite that includes the component.<sup>9</sup>

#### FINDINGS

Presentation of the findings is arranged in four sections: the group trend, individual trends, variability, and influence of treatment. The first three sections are based on the fifty-five subjects not treated orthodontically. The fourth section deals with the seven subjects receiving particular types of orthodontic therapy.

*The Group Trend.*—Analysis to determine the group trend began with the computation of means. The arithmetic mean was computed at each annual age from 4 years to 12 years for the sample of boys, the sample of girls, and the entire sample (that is, both sexes combined). Table I presents the values obtained. Examination of this table shows:

TABLE I. MEANS FOR NASAL HEIGHT (NASION TO ANS) EXPRESSED AS A PERCENTAGE OF SUBNASAL HEIGHT (ANS TO MENTON)

AGE (YEARS)	BOYS (N = 27)	GIRLS (N = 28)	TOTAL GROUP (N = 55)
4	71.5	71.9	71.7
5	72.8	73.2	73.0
6	74.1	74.8	74.4
7	75.0	76.2	75.6
8	76.0	77.0	76.5
9	77.0	78.1	77.5
10	77.6	79.0	78.3
11	78.4	79.5	79.0
12	78.8	79.5	79.2

1. The means in each column, expressing nasal height as a percentage of subnasal height, increase with age.

2. For the total group at the age of 4 years, the nasal component of the facial height is 71.7 per cent of the subnasal component. By age 12 years, the mean index of the total group has risen to 79.2 per cent.

3. The means specific for sex do not differ markedly from the means representing the entire sample. This follows since, on the average, there is less than 1.0 percentage point difference between the means for the one sex and those for the other.

Utilizing the first and last columns of Table I, the points shown in Fig. 1 were plotted and a smooth curve was drawn to them. This curve portrays a group trend that ascends and is concave to the abscissa scale for age. More

explicitly, Fig. 1 depicts the finding that over the childhood years the group trend for nasal height in percentage of subnasal height is a negatively accelerated increasing function of age.

Ortiz and Brodie<sup>12</sup> state that between birth and adulthood the average percentage contribution of "parts of the face to total face height" is the same "regardless of age" (see, also, Brodie<sup>2, 3</sup>). The present study challenges the soundness of this generalization with respect to the childhood period from the age of 4 years to the age of 12 years.

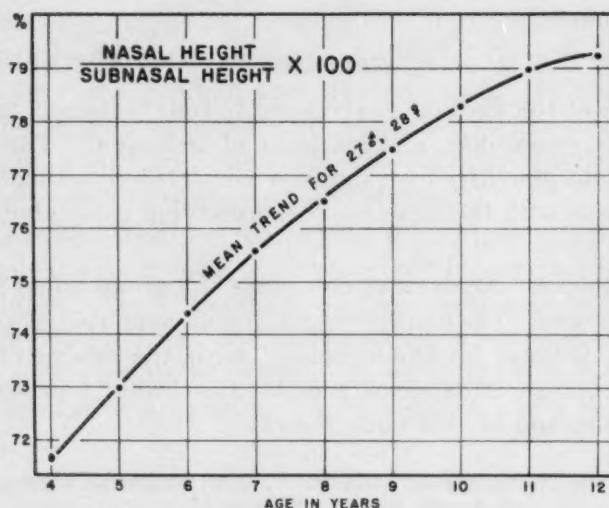


Fig. 1.—Curves drawn to means for fifty-five orthodontically untreated children studied longitudinally from the age of 4 years to the age of 12 years.

*Individual Trends.*—The first step toward analysis of trends for individuals was the plotting of fifty-five graphs, one representing the series of indices on each subject. By inspection and intercomparison of these graphs, it was found meaningful and practicable to make three subgroup analyses. Subgroups were constituted as follows:

*Subgroup A:* Children whose index curves rose progressively from age to age and increased more than 10.0 percentage points between the age of 4 years and the age of 12 years. Twelve subjects (five boys and seven girls) met these criteria.

*Subgroup B:* Children whose index curves increased more than 4.0 percentage points during the age interval of 4 to 8 years and, during the age interval of 8 to 12 years, changed less than 2.0 percentage points. Sixteen subjects (eight of each sex) satisfied these stipulations.

*Subgroup C:* Children whose index curves remained constant from age to age or changed within a range not exceeding 5.0 percentage points. Twelve subjects (six of each sex) qualified for inclusion here.

A composite trend for each subgroup was derived by tabulating the indices for each member of a subgroup according to age, calculating means at successive ages, plotting these means, and drawing a smooth curve to them.

The three subgroup trends are shown in Fig. 2. It will be seen that: (1) the trend for Subgroup A ascends from 69.5 at the age of 4 years to 81.6 at the age of 12 years and is approximately rectilinear; (2) the trend for Subgroup B rises from 73.0 at the age of 4 years to 79.0 at the age of 8 years and registers little change over the age period of 8 to 12 years; (3) the trend for Subgroup C exhibits a slight rise from 4 to 7 years of age (72.6 to 74.5) and runs practically parallel with the abscissa between 7 and 12 years of age.

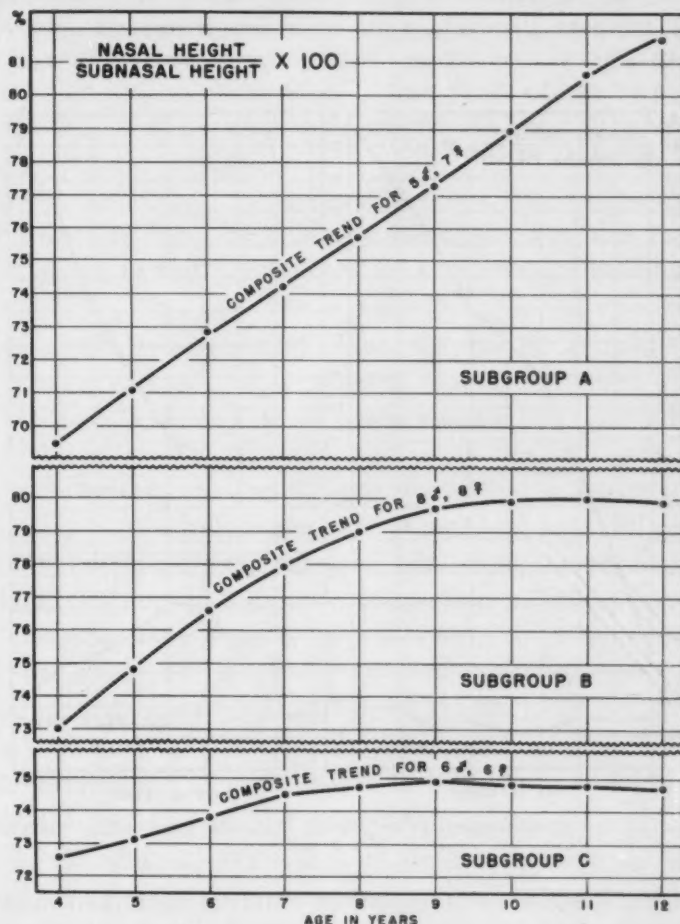


Fig. 2.—Curves drawn to means for three subgroups of orthodontically untreated children studied annually between the ages of 4 and 12 years. See text on criteria of subgroup formation.

Fig. 3 reproduces the index curves for four children. Subject 40M shows the greatest change, and Subject 28F shows the least change. For the former, the change is more than 15.0 percentage points; for the latter, it is less than 1.0 percentage point.

The curve for Subject 4F depicts relatively little increase between 4 and 8 years of age (2.1 percentage points) and marked increase between 8 and 12 years of age (8.5 percentage points). Only one other child was found to have an index trend similar to this.

Subject 49F shows a slowly declining index between 8 and 12 years of age. She is one of three children whose indices were found to decrease as much as 2.0 percentage points after 8 or 9 years of age.

Writing with explicit reference to the individual, Brodie<sup>4</sup> has stated that the nasal and subnasal segments of total face height "yield the same percentages at any age." As an illustration, he specified that if nasal height is found to constitute 43 per cent of total face height at an early age "it will continue to be 43 per cent throughout life." The curves for individuals obtained in the present study support Brodie's claim in a few instances only (for example, Subject 28F in Fig. 3).

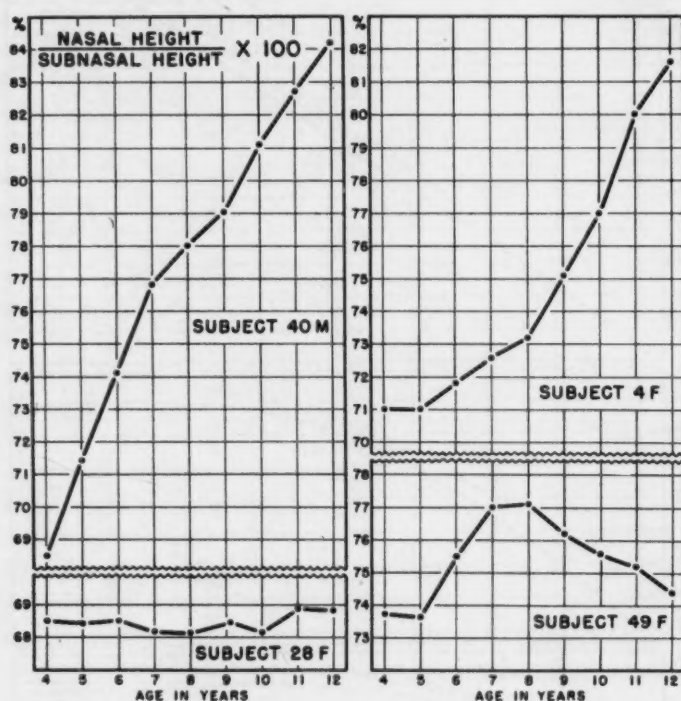


Fig. 3.—Four curves for orthodontically untreated children illustrating individual differences in age trend.

Coben,<sup>6</sup> using a sample of forty-seven children examined in late childhood and again several years later, has reported that the distribution obtained for change in nose height relative to face height gave a range of 14.0 percentage points. Fig. 3 indicates that the results from the present study harmonize with Coben's results.

**Variability.**—Distributions for nasal height in percentage of subnasal height were made at five selected ages. The dispersion of each distribution was described by recording its extreme values and computing four intermediate percentiles. Reference to Table II reveals:

1. In the fifty-five children studied, nasal height in relation to subnasal height varies from 65.0 to 79.8 per cent at the age of 4 years and from 68.3 to 91.4 per cent at the age of 12 years.

TABLE II. VARIABILITY OF NASAL HEIGHT (NASION TO ANS) EXPRESSED AS A PERCENTAGE OF SUBNASAL HEIGHT (ANS TO MENTON)\*

AGE (YEARS)	MINIMUM	PERCENTILES				MAXIMUM
		10	30	70	90	
4	65.0	66.6	69.0	73.9	77.2	79.8
6	66.7	69.2	71.6	76.0	80.4	83.9
8	66.3	71.6	73.7	78.0	83.8	86.2
10	66.9	72.5	75.5	80.6	84.4	91.6
12	68.3	73.5	76.4	81.5	84.7	91.4

\*Values derived from distributions for the same 55 children at each biennial age.

2. At the age of 6 years 10 per cent of the children had indices below 69.2, and 10 per cent had indices above 80.4. At 10 years of age 30 per cent of the indices were below 75.5, 40 per cent were between 75.5 and 80.6, and the remaining were 30 per cent above 80.6.

3. In general, variability increases with age. The range (highest value minus lowest value) is 14.8 percentage points at the age of 4 years, 19.9 percentage points at the age of 8 years, and 23.1 percentage points at the age of 12 years.

To illustrate the normative usefulness of Table II, let it be assumed that five children 8 years of age have been found to have indices of 69.0, 72.0, 75.0, 80.0, and 85.0. Table II shows that, in relation to the subnasal portion of facial height, the nasal portion is short in the first child, moderately short in the second, average in the third, moderately long in the fourth, and long in the fifth. Note that an index of 72.0 indicates a typical nasal-subnasal relation at the age of 4 years and a short nasal-long subnasal relation at the age of 12 years.

The variability of nasal height in percentage of facial height has been studied by Coben<sup>6</sup> in forty-seven white children 7 to 10 years of age and by Herzberg and Holic<sup>10</sup> on 326 adult skulls. For the former subjects, "none of whom received orthodontic treatment," nasal height in relation to facial height varied from a minimum of 41.3 per cent to a maximum of 50.5 per cent. For the latter, the distribution of nasal height in relation to facial height gave "a range of from 37.5 per cent to 51.4 per cent."

*Influence of Treatment.*—This section presents findings on the seven subjects who received orthodontic treatment considered likely to cause temporary and/or permanent increase in subnasal height. Fig. 4 shows the index curve for each child, together with an abstract of his treatment record. In order to register the impact of treatment to the fullest extent possible, indices are plotted at semiannual intervals in the vicinity of treatment periods.

The therapy for Subjects 60F, 12F (5.3 years), 22M, and 63F (4.4 years) involved gold overlay crowns cemented to deciduous molars, either for correction of a posterior cross-bite or to provide attachment for Class II elastics. In each instance, the curve reflects increased subnasal height by an immediate drop in the index. For Subject 25F, the effect of overlays is confounded by the concomitant use of a bite plate, which was in place during the film exposures at 5.5 years, 6 years, and 6.5 years.

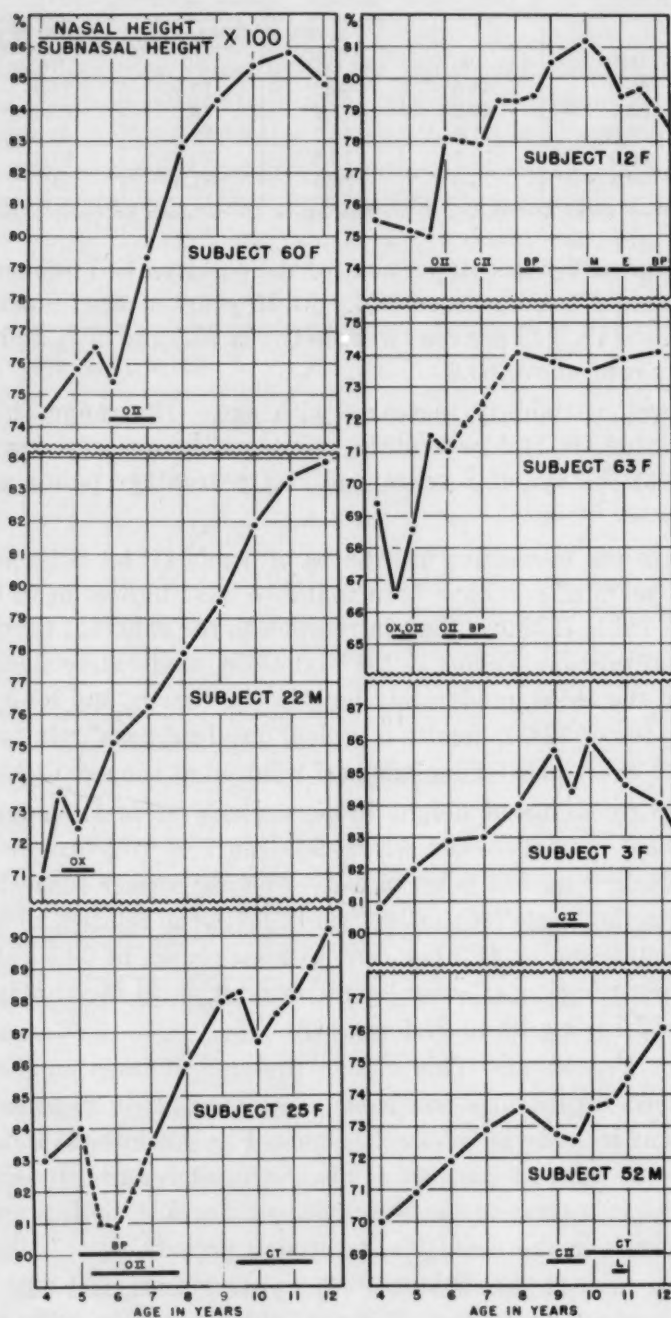


Fig. 4.—Individual curves for seven children receiving "bite-opening" therapy. *OII*, Overlay crowns on deciduous molars for Class II elastics; *OX*, overlay crowns on deciduous molars for cross-bite; *BP*, bite plate; *CT*, cervical traction; *OII*, Class II elastic traction; *M*, monoblock (Andresen); *E*, extraction (premolar) with retraction of anterior teeth; *L*, leveling arch wires. Black triangle indicates point obtained with subject wearing bite plate.

Use of Class II elastics with banded appliances is associated with an increase in subnasal height in Subjects 12F (6.9 years), 3F, and 52M (8.7 years). The impact of treatment is registered decisively for Subjects 3F and 52M; for Subject 12F, this interpretation is less certain.

The remaining treatment episodes do not lead to clear generalization regarding modification of the index. Bite plates were employed in Subjects 12F, 63F, and 25F. The biologic effect is obscured; several values for Subjects 63F and 25F (those represented by black triangles in Fig. 4) were obtained from films exposed with the bite plate in place, that is, under conditions of mechanical separation of the upper and lower teeth. Subject 12F wore a monoblock appliance, a removable acrylic plate designed to open the bite, for seven months. While this treatment is associated with a drop in the index, more than one inference is possible as the drop continues steadily to 14 years of age. Use of cervical traction coincides with a drop in the index for Subject 25F. No such relation is found for Subject 52M, in whom previous Class II elastic traction had tipped the molars distally and opened the bite. Nor is there a definitive index change manifest for Subject 52M from subsequent use of leveling arch wires.

Epitomizing for the influence of orthodontic treatment, it appears that when bite-opening procedures are initiated, they produce a temporary increase in subnasal height and consequently a temporary decrease in the percentage relation of nasal height to subnasal height. A similarly explicit statement cannot be made regarding the long-term influence of orthodontic therapy; the tendency for curves to return to their apparent age trend shortly after the initiation of treatment lends support to the hypothesis that long-term clinical effects are either small in magnitude or not present.

#### SUMMARY

The relation between two components of facial height is investigated over the childhood period from the age of 4 years to the age of 12 years. Longitudinal data are described and analyzed for  $\frac{\text{nasal height}}{\text{subnasal height}} \times 100$ . Age trends and individual differences of fifty-five children who had not received orthodontic treatment and seven children who had been subjected to "bite-opening" therapy are presented and discussed.

Age trend findings for the childhood years are that (1) on the average, the nasal component of facial height increases in relation to the subnasal component and (2) for individuals, nasal height in percentage of subnasal height may remain practically constant from age to age, or it may increase as much as 15 percentage points. Individual differences in nasal height relative to subnasal height are distributed from a minimum of 65.0 per cent (at the age of 4 years) to a maximum of 91.6 per cent (at the age of 11 years). In the small group of children treated orthodontically, it is found that after "bite-opening" procedures are initiated, they produce a temporary increase in subnasal height and consequently a temporary decrease in the percentage relation of nasal height to subnasal height.

## REFERENCES

1. Broadbent, B. H.: Ontogenic Development of Occlusion, *Angle Orthodontist* **11**: 223-241, 1941.
2. Brodie, A. G.: On the Growth Pattern of the Human Head, *Am. J. Anat.* **68**: 209-262, 1941.
3. Brodie, A. G.: On the Growth of the Jaws and the Eruption of the Teeth, *Angle Orthodontist* **12**: 109-123, 1942.
4. Brodie, A. G.: Facial Patterns, a Theme on Variation, *Angle Orthodontist* **16**: 75-87, 1946.
5. Brodie, A. G.: Appraisal of Present Concepts in Orthodontia, *Angle Orthodontist* **20**: 24-38, 1950.
6. Coben, S. E.: The Integration of Facial Skeletal Variants, *AM. J. ORTHODONTICS* **41**: 407-434, 1955.
7. Cole, L. W., and Morgan, J. J. B.: *Psychology of Childhood and Adolescence*, New York, 1947, Rinehart & Co., p. 22.
8. Cruze, W. W.: *Adolescent Psychology and Development*, New York, 1953, Ronald Press Co., p. 80.
9. Guilford, J. P.: *Fundamental Statistics in Psychology and Education*, New York, 1950, McGraw-Hill Book Company, pp. 357-358.
10. Herzberg, F., and Holic, R.: An Anthropologic Study of Face Height, *AM. J. ORTHODONTICS & ORAL SURG.* **29**: 90-100, 1943.
11. Higley, L. B.: Head Positioner for Scientific Radiographic and Photographic Purposes, *INT. J. ORTHODONTIA* **22**: 699-704, 1936.
12. Ortiz, M. H., and Brodie, A. G.: On the Growth of the Human Head From Birth to the Third Month of Life, *Anat. Rec.* **103**: 311-333, 1949.
13. Thompson, J. R., and Brodie, A. G.: Factors in the Position of the Mandible, *J. Am. Dent. A.* **29**: 925-941, 1942.
14. Thurow, R. C.: Cephalometric Methods in Research and Private Practice, *Angle Orthodontist* **21**: 104-116, 1951.
15. Zubek, J. P., and Solberg, P. A.: *Human Development*, New York, 1954, McGraw-Hill Book Company, p. 111.

## Orthodontic Profiles

---

HARRY ESTES KELSEY

THE influence of a person on a field of endeavor is more than the cumulative result of what he has been and what he has done through the years. It starts long before his advent into his chosen field—even before birth, the channels of inheritance and environment are at work—and it does not cease at death. Great financiers, political figures, philanthropists, scientists, and educators leave their obvious mark. But persons not so much in the public eye who have rendered effective service are also remembered as benefactors of human progress. Among these are many in the health professions to whom succeeding generations will ever be indebted.

Dentistry as a profession had been in existence slightly over a half-century when Harry Estes Kelsey graduated from the first dental school in the world (the Baltimore College of Dental Surgery) in 1896. With an inquisitive mind, as evidenced by his later service to his profession as a member of the Research Commission of the American Dental Association, he decided to continue his widening interest in orthodontia and became associated with Dr. E. A. Bogue of New York City, one of America's earliest devotees of the practice of correcting irregularities of children's teeth. This move was to have a far-reaching effect on Dr. Kelsey's future. In New York at that time, Dr. Edward H. Angle, foremost advocate of orthodontia as a special field of practice, was conducting his classes. Enrolled were such future outstanding orthodontists as Hellman, Mershon, and Noyes. Listed also was Harry E. Kelsey. He was applying to his own professional efforts a view concerning "further orthodontic training" which he expressed in 1916 in his presidential address to the Eastern Association of the Graduates of the Angle School of Orthodontia of which he was a charter member. He stated, "This is a subject [further orthodontic training] which is or should be very near to the hearts of all orthodontists desirous of real progress in the profession. Unless we see to it that the best provision is made for the education of more men along these lines we are under the suspicion of existing as a profession for our own benefit only. It is our duty to find out as time goes on if this is true and to aid in directing into this specialty the class of men that will be a credit to it." As a teacher at his alma mater, he was Professor of Orthodontics until 1923, when the Baltimore College of Dental Surgery merged with the University of Maryland, and Dr. Kelsey was able to put into practice the words he spoke, for not only did he choose in a period of two decades five young men to become associated with him, but there were

others who came under his influence who were inspired to enter the specialty. These men can attest that he was not just an employer but a teacher, counselor, and friend. I quote from a letter received from one of his former associates:

Dr. Kelsey always impressed me as being a man of thoroughly professional attitude and outlook, and I feel it quite appropriate that an award for "professional demeanor" at the University of Maryland should carry his name. (This award was established by his five former associates—Anderson, Devlin, Preis, Hodges, and Johnston.) In evidence of this professionalism, I would say that he seemed always reluctant to overemphasize any orthodontic premise or to encourage you to expect too much from any orthodontic therapy you might be employing. His recognition of the limitations of treatment and the fact that we do not know all the answers caused him to be particularly cautious about making positive statements. There was usually more than one way to do a thing, and the prognosis was to be improvement but not perfection.

In spite of the expertness that he had developed in his work, I found him to be open-minded and willing to recognize and respect the work of men younger and less experienced than he was. I recall an instance when I had formed a lingual arch wire for one of his patients and, although the actual wire manipulation was good, I had misinterpreted his intentions for its use. He was kind enough to compliment me on the exhibition of technique, even though, as he explained, I had missed the point of its intended use.

Later, as a member and as president of the American Board of Orthodontics, he was able to continue to channel his efforts toward better men for better orthodontics. In 1942 that Board awarded Dr. Kelsey, in recognition of his many contributions to the advancement of orthodontics, the Albert H. Ketcham Memorial Award, an honor which was well deserved.

Dr. Kelsey was attentive to changes and improvements in orthodontic methods. He wanted to know and do what was best; he was a willing listener, and he was not averse to giving any reasonable idea a good trial. In the 1930's, when Charles Tweed was showing the need for re-evaluation and deeper consideration of treatment problems, Dr. Kelsey said to an associate that he "wanted to go out to Tucson, Arizona, and see what this young fellow, Charley Tweed, was doing." Later, after Dr. Kelsey had seen a series of fifty cases exhibited by Dr. Tweed, he said to another associate that if he (Dr. Kelsey) were a younger man he would certainly study and try the practice of Tweed's philosophy and methods.

In retrospect, we realize that Dr. Kelsey's influence through his professional abilities and qualifications was complemented, in the words of another former associate, by his "unhurried, unruffled, always most gracious and suave, courtly manner. The very clothes he wore seemed to be thoroughly in keeping with the simplicity of his character."

Dr. Kelsey was married in 1903 to Eva Pauline Hamill, daughter of George W. Hamill, M.D., and Blanche Grove Hamill of Baltimore. He died in 1946 and Mrs. Kelsey died in 1948. They were very fond of their summer place at Sherwood Forest on the Severn River near the Chesapeake Bay and liked to entertain there, for not only water sports but golf and other activities as well were available. In fact, Dr. Kelsey's golf club membership would have staggered the average person, but with his genial, kindly, and friendly disposition,

it was natural for him to be extended the opportunity for membership, especially if a new club was being formed. Although Dr. and Mrs. Kelsey had no children, Dr. Kelsey had a very real interest in and love for children, as will be attested to by several thousand of them for whom he performed a highly creditable professional service and for whom, through his personality, he left enduring memories.



HARRY ESTES KELSEY

He was an avid out-of-doors man. This came natural, for Samuel Truman Kelsey and Katherine Ricksecker Kelsey, his parents, had migrated in 1854 from New York to Illinois and in 1864 to Kansas, where Harry Estes Kelsey was born on July 9, 1872. Two years later the family settled in North Carolina, where the interests of forestry and the mountains as a vacation spot were to influence Samuel Truman Kelsey and his sons throughout their lives. In fact, Harlan, the twin brother of Harry, became a noted nurseryman with extensive horticultural interests. Maryland, with its vast water and land areas devoted to wild life pursuits, was an ideal spot for Dr. Kelsey's recreational

activities. When not participating, he was willing to labor as an official for the success of many sporting events, and for years he was active in the South Atlantic Association of the Amateur Athletic Union.

It was natural for a man with so many interests, who could prove himself so adept at his professional service and actively participate in social and civic affairs, to evince an interest in organizations of his profession and specialty. Dr. Kelsey served on the Board of the Family and Children's Society of Baltimore and was active in the affairs of the University Club. As a member of scientific societies, his abilities and contributions (fifty-seven listed articles and clinical reports, plus many others) were appreciated and recognized. He was elected president of the Maryland State Dental Association, the Baltimore City Dental Society, the American Association of Orthodontists, the New York Society of Orthodontists, the Southern Society of Orthodontists, and the Washington-Baltimore Society of Orthodontists. The Southern Society met in Baltimore in 1928, and during that meeting the Baltimore City Dental Society sponsored a dinner in Dr. Kelsey's honor at which several of his long-time friends from distant places spoke in gracious and complimentary words of Dr. Kelsey's influence on orthodontics. This affair was well reported in our journals. (The reports can be found by referring to the *Dental Index* of the American Dental Association.) He was granted membership in Omicron Kappa Upsilon (honorary dental fraternity) and in the American College of Dentists. His name was well known internationally; he was a member of the European Orthodontological Society, and when the Dental Centenary celebrating the founding in 1840 of the first dental school in the world was held in Baltimore in 1940 Dr. Kelsey was chairman of the Committee on International Relations.

By 1940 Dr. Kelsey had earned a well-deserved respite from active and arduous professional duties and responsibilities, and he decided to retire. A six-year period to enjoy travel, reading, and fulfillment of long-cherished desires was terminated in 1946 by a heart attack as he was seated at lunch with his devoted wife in their apartment on lovely Charles Street in Baltimore, opposite the Johns Hopkins University campus. Thus a career which anyone could be proud to emulate came to an end.

The profession of dentistry was fortunate when Harry Estes Kelsey decided to enter it; the specialty of orthodontics, in its developing years, needed just such a person. His influence was not merely for the time that he was active, but a decade after his death his name is familiarly and respectfully recalled. The orthodontic roster is studded with names of men of great competence. Among them, without question, is the name of Harry Estes Kelsey.

*George M. Anderson.*

## In Memoriam

---

**RALPH WALDRON**  
1876-1957

THE dental profession, and the specialty orthodontics in particular, lost one of its prominent members and pioneers on July 24, 1957, when Ralph Waldron died.

Dr. Waldron received his preprofessional education at St. Mary's School, Edgehill, Liverpool, England, and in the Wallingford, Connecticut, public schools. His professional degree of doctor of dental surgery was received from the New York College of Dentistry (now New York University School of Dentistry) in 1906. He was a close friend of the famous Dr. Rodrigues Ottolengui and studied under his direction in 1910.

Dr. Waldron was president of the American Association of Orthodontists in 1924. During his term as president he was instrumental in bringing Dr. Paul Simon from Berlin to introduce gnathostatics to the American Association of Orthodontists. He served the Association, which was then known as the American Society of Orthodontists, as secretary from 1919 through 1922 and as chairman of the Board of Censors from 1914 to 1918. He was also president of the Central Dental Society (now the Essex County Dental Society) in 1912.

Ralph Waldron was an able teacher and lecturer. He was Professor of Orthodontics at New York University for seventeen years from 1910 to 1927. He also had served as a guest lecturer at Harvard, University of Pennsylvania, University of Berlin in Germany, and University of Southern California. Dr. Waldron also collaborated with Dr. Benno Lischer in conducting two short intensive courses in gnathostatics at Columbia University School of Dental and Oral Surgery.

In addition to his active teaching interests, he was a Fellow of the American College of Dentists, Essex County Dental Society, New York Academy of Dentistry, New Jersey State Dental Society, American Dental Association, a charter member of the New York Society of Orthodontists (now the Northeastern Society of Orthodontists), the American Association of Orthodontists, European Association of Orthodontists, and Mexican Orthodontic Society. He was a member of Omicron Kappa Upsilon honor society and Delta Sigma Delta fraternity. He was a member of the Scottish Rite and a Thirty-second Degree Mason. He also was a member of the Newark Rotary Club and The Torch Club.

Dr. Waldron was born in 1876 in Liverpool, England, and was brought to the United States when he was 10 years old. He leaves a wife, Olga Kohn Waldron; a daughter, Mrs. Evelyn W. Kasen of South Orange, New Jersey; and two grandchildren, Waldron and Lynn Kraemer, also of South Orange, New Jersey.



RALPH WALDRON

Dr. Waldron was an avid writer and contributed to our orthodontic literature. It is impractical to list all his papers and discussions given before orthodontic and dental societies, but a few of the most noteworthy can be mentioned. They are as follows: "Treatment of Class II," published in AMERICAN JOURNAL OF ORTHODONTICS in 1919; "Dynamics of Angle Mechanism by a Non-Angle Man," published in AMERICAN JOURNAL OF ORTHODONTICS in 1929 (probably his best paper); "Reviewing the Problem of Retention," published in the AMERICAN JOURNAL OF ORTHODONTICS in 1942, which even today stands as a landmark in the literature. He was always a willing contributor in the role of clinician and gave innumerable clinics before local dental societies and the Northeastern, American, European, and Mexican Orthodontic Societies.

In the death of Dr. Ralph Waldron, the dental profession, and orthodontics in particular, lost an outstanding member, who reflected the highest honor

upon our society and dentistry. Through his enthusiasm and untiring efforts many have greatly benefited. He was always willing to share his knowledge and experience with those who sought his advice, counsel, and judgment. Young men constantly admired this gentleman, who by hard work, long study, sincerity, and earnestness had attained a degree of success enjoyed by few. He possessed an inquisitive mind which sought constantly to analyze, alter, and improve on the techniques, instruments, and materials indigenous to our field.

He had a remarkable memory that served to augment his natural curiosity and quest for learning. He was learned in music and literature, and his nature made him an ardent traveler.

Dr. Waldron worked and lived to an advanced age with always a zest for life, ever enjoying the respect of all whose good fortune it was to know him.

*Whereas*, the members of the Northeastern Society of Orthodontists have learned with profound sorrow of the passing of their distinguished fellow member and benefactor, Dr. Ralph Waldron, and

*Whereas*, the Northeastern Society of Orthodontists gratefully recognizes the untiring and devoted labors exemplified by his generous and valuable contributions, which have enriched our orthodontic practice and literature, and

*Whereas*, our members wish to take note of the passing of this gentlemanly member whose labors have ever been in the interest of his chosen profession.

*Be it resolved* that this sense of great bereavement, though inadequately expressed, be spread upon our minutes as an everlasting memorial to him who labored long and well for the benefit of his fellow man and the profession he loved so well, and

*Be it further resolved* that a copy of this resolution be sent to the members of his family as an expression of our sympathy and heartfelt condolence.

Respectfully submitted,

*William R. Joule.*

## Department of Orthodontic Abstracts and Reviews

---

Edited by

DR. J. A. SALZMANN, NEW YORK CITY

All communications concerning further information about abstracted material and the acceptance of articles or books for consideration in this department should be addressed to Dr. J. A. Salzmänn, 654 Madison Avenue, New York City

---

**Radiation Hazards in Dental Radiography.** By Sydney Blackman and J. R. Greening. *Brit. Dent. J.* 102: 167-172, 1957.

The possessor of an x-ray apparatus should bear in mind that he is operating a lethal machine and that it is his duty to acquaint himself fully with the hazards, both to his patient and to himself, which might accrue from ignorant and careless misuse of a potentially dangerous supplemental instrument for investigation of disease.

All radiation is dangerous, whether it be the beam of x-rays emanating from the tube, radiation leaking through the tube head encasement, or the scattered radiation from the patient or other objects. The effects of accumulated radiation received by a person are not entirely eliminated or dissipated merely by withdrawing himself from the field of operation during a vacation period. After considerable dosage, certain permanent changes take place within the framework of the person, which may affect his skin, his eyes, his blood vessels, and general cellular formation; under certain conditions, biologic mutations may be transmitted to succeeding generations.

The dosage of radiation is expressed in roentgen units (r) which may be interpreted as that quantity of X or gamma radiation which, when absorbed by air, produces in 1 c.c. of air, at standard temperature and pressure, ions carrying one electrostatic unit of charge, of either sign. The maximum permissible dose for each x-ray worker is limited to 0.3 r per week, measured in air.

This recommendation, made by the International Commission on Radiological Protection, applies only to the radiation worker. Recommendations as to the maximum permissible dose for the occasional recipient of x-radiation, the patient, are less definite. The Medical Research Council's report on "The Hazards to Man of Nuclear and Allied Radiations" lays down the rule that the non-x-ray worker should not be allowed to receive more than 200 roentgens of x-radiation to his whole body (excepting the reproductive organs) during his lifetime.

All authorities agree that the radiation exposure of the patient should be reduced as much as is compatible with successful diagnostic investigation, and the M.R.C. report also distinguishes between radiation damage to the individual patient and anticipated damage to succeeding generations. Radiation to the major part of the patient's body affects only the patient himself, but any radiation received by the reproductive organs may have the effect of producing genetic mutations.

The amount of radiation which is judged likely to produce a significant mutation change is one-fourth of the whole body dose (200 r), and this recommended maximum of 50 roentgens should not be received by the person during

that part of life before he or she is likely to produce children (reckoned as the age of 30 years), and, furthermore, it should not be received by more than one-fiftieth of the population. After this age, the "gonad dose" is of less significance, but during this time it will, in many cases, set a limit to the dosage which can be given to the pelvic regions.

The dental patient often receives a considerable amount of radiation during his lifetime. Repetitive examinations are carried out in the root-filling of teeth, in the charting of erupting teeth during early years and the progress of post-operative conditions, and in the checking of bony union after fractures. Orthodontists are demanding lateral views and cephalometric pictures in addition to routine all-round films, oral surgeons insist on additional extraoral radiography, and prosthodontists who are undertaking occlusal reconstruction under radiographic control are calling for serial x-ray examination of both temporomandibular joints in at least three positions.

Dental radiography involves negligible dosage to the patient's reproductive organs; thus, for most purposes, the maximum permissible limit of dose to the patient is set by the dose to the lens of the eye and, possibly, to the lymphatic tissue.

Dental radiography may well be only one of the radiographic examinations which the patient may need in his lifetime, and it is therefore important that every care should be taken to reduce the dose to the patient in order that adequate dosage may still be available for an emergency or routine examination which at some future time may be necessary in order to save the patient's life. Careful measurement of most of the accepted dental radiographic techniques, including such new techniques as pantomography and serial arthrometric radiography of the temporomandibular joints (provided that the administration of additional radiation to a person is given circumspectly, correctly calculated, and given under conditions of the greatest protective measures), shows the dose to be sufficiently small.

In such circumstances, there is a definite margin of safety in dental and facial radiography. However, unless the foregoing precautions are taken, the amount of radiation may rise to disconcerting levels.

The immersion of the x-ray tube in oil within an encasement of protective material has practically eliminated radiation leakage.

With the emission of the x-ray beam from the tube head, the dangers resolve themselves to primary and secondary radiation risks, to both the patient and the operator. When the issuing x-ray beam strikes any substance, part of the beam may be absorbed and the rest scattered or dispersed, altered in direction but almost unaltered in quality. Again every substance receiving direct or scattered radiation itself gives out x-rays from all depths, the quantity increasing in amount with the thickness traversed by the rays.

Scattered radiation arises everywhere, from the tissue through which it is passing, from the bones of the patient, or surrounding items of apparatus, from cassettes, and from the table if the patient is resting on or against it. Although the intensity of the primary beam is reduced through increasing distance and absorption, the radiation reaching the film is somewhat increased by the scattered rays projected toward it from the parts of the body nearer to the x-ray tube.

The scattered rays are to be found more in the forward and backward directions of the original beam than at right angles, under normal conditions of dental radiography. The greater the penetrating power of the primary beam (that is, the kilovoltage), the greater is the increase not only in magnitude, but also in the penetrating power of the scatter. The hazards of scattered radiation are similar to those of primary rays.

Methods of reducing radiation exposure of the patient:

1. Use the fastest films compatible with the detail required. This reduces the exposure time.

2. Reduce the area irradiated to a minimum. The amount of primary radiation is proportional to the intensity of the x-rays delivered, while the amount of secondary radiation varies with the volume of tissue irradiated. The smaller the field, the less the stray radiation and the less volume dose to the patient from both primary and secondary rays.

By the introduction of a lead or other restricting diaphragm at the outlet of the tube head, the size of the emanating x-ray beam can be limited and the rays confined to the minimum necessary area on the skin surface of the patient.

Instead of the pointed plastic cone attached to the tube head, it is believed that some advantage might be gained in accuracy of positioning and in reduction of radiation by the use of a narrow protective cylinder. This would not only have the effect of confining the beam to within the required diameter, but would also reduce scattered radiation from the plastic cone itself.

3. Ensure that as high a proportion as possible of the radiation issuing from the x-ray tube is radiographically useful (that is, penetrates the patient and reaches the film).

This is achieved by (a) using the highest kilovoltage that gives adequate contrast and (b) inserting an aluminium filter in the beam to absorb its least penetrating components, which are largely absorbed in the skin.

4. Use long focus-skin distances, so that the x-ray intensities on the patient's skin and at the film do not have too large a ratio. In dental radiography it is recommended that a focus-skin distance of not less than 8 inches be adopted.

It follows, from suggestions 3 and 4, that x-ray units which employ both very low voltage and very short focus-skin distances should be deprecated as producing greater patient dose per film.

5. Protect critical tissues with some x-ray-absorbing material. In view of the large amount of lymphatic tissue in the region of the neck, which is most sensitive to radiation, it might be contemplated that a shield or bib of lead rubber be worn to protect the patient's neck from secondary radiation. Similarly, the eyes should be shielded with lead goggles.

6. Reduce the number of exposures to a minimum. Repetitive and control radiographs should be limited to absolute necessity. Some of these points may be illustrated by considering the doses received by the patient in the fourteen intraoral full-mouth techniques.

*Doses Received in Fourteen-Film Full-Mouth Techniques.*—A simple model was made of a dental x-ray unit, using a light source in place of the x-ray tube. This was set up in positions corresponding to a fourteen-film full-mouth technique and a record was kept of the exposures during which fourteen points of interest were irradiated and of the distances of those points from the source of radiation during exposure. It was thus possible to calculate the doses received at these fourteen points, knowing the x-ray output under standard conditions.

Dental x-ray units used at about 8 inch (20 cm.) focus-skin distance irradiate a skin surface about 11 cm. diameter when used without a limiting diaphragm. The beam width at the film has increased to approximately 13 cm. This is larger than is necessary to cover a film only 4 by 3 cm. in size.

The authors investigated the effect of reducing the aperture at the base of the plastic directioning cone from the normal  $2\frac{1}{2}$  inches (6.3 cm.) to  $1\frac{3}{8}$  inches (3.5 cm.). They show the areas irradiated during a fourteen-film investigation using limiting apertures of these two sizes. The smaller aperture still gives a beam width at the film of about 7 cm., but reduces the area irradiated at each exposure to less than one-third of that irradiated using the  $2\frac{1}{2}$  inch aperture and very much reduces the degree of overlap during a fourteen-film investigation.

Although different x-ray units and films will often require appreciably different exposure factors, the relative exposures in fourteen-film techniques will be quite closely the same. If the exposure required for a lower incisor or canine is called unity, the relative exposures will be found to be close to those given in Table I.

TABLE I. RELATIVE EXPOSURES IN FOURTEEN-FILM FULL-MOUTH TECHNIQUES

LOWER				UPPER			
INCISOR	CANINE	PRE-MOLAR	MOLAR	INCISOR	CANINE	PRE-MOLAR	MOLAR
1	1	$1\frac{1}{2}$	2	2	$1\frac{1}{2}$	2	3

It is shown that (1) the use of fast films reduces the doses by a factor of nearly 3, (2) the smaller diaphragm reduces the total dose received at the fourteen points by a factor of  $2\frac{1}{2}$ , and (3) the use of an added filter of 1 mm. aluminum reduces the doses by a factor of just over 2. A combination of all three methods reduces the doses by a factor of 15, the doses with fast film, filter, and small aperture being only 7 per cent of those with the slow film, no added filter and the normal aperture.

With 40 to 50 r, which can be received under the worst conditions, the dose to the eye in particular should be noted. The lens of the eye is regarded as critical tissue as far as radiation damage is concerned and, although the overlying tissue will reduce the doses quoted which relate to the surface of the cornea, the dose to the lens will still be substantial. Even with the smaller aperture, the eye is still in the direct beam when upper molars, premolars, and canines are radiographed, and it may well be worth while to use a small lead-covered eye shield during these exposures.

In the technique used at the Royal Dental Hospital for the radiography of the temporomandibular joints, a short focus-skin distance is used in order to avoid the superimposition of structures. The beam size is kept small both to protect the patient and, by reducing the quantity of scattered radiation, to produce a cleaner radiograph.

The skin dose during a single exposure is about 10 r, using an unfiltered beam at approximately 65 kv. This dose is halved by the use of an added filter of 1 mm. aluminum. If 3 mm. aluminum is added, the kv. needs to be increased to 70 to compensate for the additional absorption, but the skin dose is decreased still further to only 2 r.

*Doses During Lateral Radiography of the Head.*—Cephalometric radiography employs an exceptionally large focus-skin distance (9 feet) and a high kilovoltage. Both these factors combine to give low skin doses which are only 0.16 r when an unfiltered beam is used and which are further reduced to 0.045 r by the use of an added filter of 3 mm. aluminum.

In view of the cumulative biologic effect of x-rays, it may be well to consider the advisability of providing each person, on a nationwide basis, with a card to carry throughout life on which is to be recorded every radiographic exposure with its equivalent r units to which he is subjected. With the maximum permissible dose before him and with knowledge of the total radiation so far received by a patient, the operator would be in position to assess the urgency and scope of any further proposed radiographic examination.

The procedures which reduce the dose to the patient also reduce the dose to the operator, but the following points should be stressed.

1. Every year an x-ray installation should be inspected and checked for radiation leakage from the tube head.
2. The operator should not stand in the direct beam of radiation coming from the x-ray tube.
3. The operator should stand at least 5 feet away from the x-ray tube and patient and should employ a long time switch cord, or preferably take up a position behind a protective screen of lead or lead glass. The patient himself is a serious source of scattered radiation.
4. No film should be held in or outside the mouth by the operator or patient. There are many useful self-retaining intraoral film holders, while for extraoral examination the head should rest against cassettes which themselves are carried in stable contrivances.
5. Hand-held fluorescent intraoral dental screens are extremely dangerous. Doses experienced during even a short fluoroscopic examination can exceed by many times the dose for a film which provides a permanent record and is therefore of more value.
6. The dosage received by all personnel exposed to radiation should be monitored continuously with a pocket ionization chamber or film badge dosimeter.

For the protection of the operator under extremely busy conditions, the recommendations of the International Commission on Radiological Protection state that protective screens should be used where weekly exposures total more than 6,000 milliamperere-seconds (approximately 300 to 600 exposures on a standard type of dental unit). Where two x-ray units are used in close proximity, it is advisable for a permanent protective screen to be provided.

The use of x-rays can involve radiation hazards to persons outside the actual radiographic room or dental surgery. The direct beam of x-rays is capable of penetrating the walls of the room, and care should be taken that the direct beam is always accurately directed at the patient. In cases of normal dental radiography, the brick and plaster walls of the room, when not less than 4 to 6 inches thick, can be shown to provide adequate protection against radiation for other persons living or working in the building, particularly when accurate directioning of the x-ray beam is the rule.

#### SUMMARY

The necessity for keeping the radiation exposure of patients to the minimum compatible with adequate diagnosis is pointed out. This exposure can be reduced by (1) using fast films, (2) using diaphragms and cones to reduce the width of the x-ray beam, (3) using an added filter of 1 mm. aluminum for intraoral films and 2 or 3 mm. aluminum for extraoral films, (4) using the highest kilovoltage compatible with adequate contrast, (5) working at long focus-skin distances, and (6) shielding critical tissues, such as the lymphatic tissue of the neck and the lens of the eye.

These points are illustrated by considering the doses received in most types of dental radiography. Additional steps required in order to safeguard the operator are also considered.

**Abstracts Presented Before the Research Section of the American Association of Orthodontists, New Orleans, May, 1957**

**Quantitative Electromyographic Analysis of Mastication:** By Samuel Pruzansky, D.D.S., Department of Physical Medicine and Rehabilitation and the Cleft Palate Center, Chicago Professional Colleges, University of Illinois, Chicago, Illinois.

Efficiency is generally expressed as a ratio of the work or energy output to the energy input. Masticatory efficiency has been largely evaluated in terms of the work output. On the other hand, little knowledge is available concerning the energy input requirements during mastication of various foods. Such information would contribute toward a more complete evaluation of masticatory efficiency.

Since the electrical action current of a muscle is a measure of the force exerted by that muscle, a method for quantification of the electromyogram was sought. An improved integrating circuit capable of presenting energy data that may be correlated with actual muscle activity was found to provide the quantitative data required. The integrator consists of a capacitive integrating circuit and associated amplifiers, rectifiers, and control and power supply circuits designed by the Armour Research Foundation of the Illinois Institute of Technology. This equipment is designed for use with Offner electromyographic equipment. The record of energy levels presented on a crystograph recorder is correlated with other electromyographic data.

Each indication of the integrator records may be interpreted in terms of energy. Energy indicated is a function of the voltage across the condenser in the integration circuit. Since the energy is given in watt-seconds or watts multiplied by time, the measured muscle may then be classified either directly in terms of energy or in watts by multiplying by the number of integrator indications per second. The energy measured is that stored in the condenser and it can be referred back through the amplifiers to the electromyographic potentials. Comparison of muscle activity of various subjects by use of the indicator required standardization of the equipment prior to each study. A method of standardization that has been employed utilizes the electromyographic calibrator and an oscilloscope.

**The Physiograph-Cephalostat:** By V. Sassouni, D.F.M.P. (Paris), M.Sc. (Dent.), and W. M. Krogman, Ph.D., LL.D., Philadelphia Center for Research in Child Growth, Philadelphia, Pennsylvania.

The physiograph is a setup by means of which the head is oriented in the Frankfort horizontal without the need of a head holder. Its main advantage lies in its simplicity and economy without sacrifice of accuracy. Most clinicians possess the equipment necessary for its use.

The Sassouni-Krogman physiograph consists of a standard slide projector (2 by 2 or 3 by 4). A slide representing a millimetric grid is projected on the face. One heavy horizontal line of the grid represents the FH; one heavy vertical line of the grid represents the midsagittal plane.

The patient is seated facing the projector; the head is then oriented so that the vertical line passes through nasion, and the horizontal line through left

orbitale and right and left tragia. A headrest insures the immobility of the patient.

In this position, first a lateral x-ray picture is taken, and then a photograph called "physioprint" because of its special attributes. The physioprint, besides reproducing a scientifically accurate profile, also gives the size and proportions of the face in the three dimensions of space. If a frontal x-ray film is desired, the head is rotated 90 degrees (always oriented in the FH).

Even if a physioprint is not taken for record, it is possible to read directly under the projected grid the dimensions and proportions for a quick evaluation of the facial balance.

The accuracy of this technique implies the following conditions:

1. The camera (and the x-ray tube) and the projector should be oriented at right angles to each other.
2. The cassette should be perpendicular to the central x-rays.
3. The camera (and the x-ray tube) and the projector should be on the same horizontal level.
4. Distortion and magnification are avoided if the camera is at least 5 feet from the subject and the projector is 8 to 10 feet from the subject. (A corner of any office should fulfill these requirements.)

This technique may be applied in orthodontics, prosthetics, oral and plastic surgery, anthropology, and criminology.

**A Cephalometric Radiographic Study of the Position of the Hyoid Bone in Relation to the Mandible in Certain Functional Positions:** By John Lee Smith, B.A., D.D.S., M.S.D., Northwestern University, Chicago, Illinois.

The normal position and pattern of hyoid bone movement in relation to the mandible in certain functional positions were studied. Selection of twenty subjects with apparently normal temporomandibular joints was done by clinical examination. Lateral cephalometric radiographs utilizing the Broadbent-Bolton cephalometer were made with the mandible in positions of occlusion, protrusion, and maximum opening. The head position of the subject exercises a definite influence on the relative positions of the mandible and hyoid bone. For this reason, the Frankfort plane was maintained as near as possible to a horizontal position while the radiographs were taken.

It was found that the hyoid bone moved forward and slightly upward when the mandible was protruded. The hyoid bone moved downward and backward in almost equal proportion when the mouth was opened wide. This opening movement was accompanied by a tendency for the head to move upward and backward. The direction of movement of gnathion and the hyoid bone from the position of occlusion to maximum opening was almost parallel. The hyoid bone assumed a position superior to gnathion in mandibular positions of protrusion and maximum opening.

Those persons who exhibited the greatest amount of backward hyoid movement in maximum opening of the mouth also showed the largest change in position and curvature of the cervical vertebrae. This change in relation between the head and vertebrae is probably responsible for the apparent increase in the range of backward movement. Fixation of the head probably evokes a different response than would be recorded if no attempt were made to restrict its movement.

## News and Notes

---

### **American Association of Orthodontists Registration of Nonmembers for Attendance at Annual Session**

To insure full participation of all active members of the American Association of Orthodontists, the following classification of nonmembers eligible to attend and schedule of attendance fees, which will be charged at the time of registration, has been set up for the coming annual session of the Association at the Commodore Hotel, New York City, April 27 to May 1, 1958.

#### **A. No Attendance Fee.**

1. Full-time teachers in university dental schools.
2. Full-time graduate or postgraduate students in university orthodontic departments. It will be necessary to present a letter from the dean of the school certifying the status of the student.
3. Dentists from outside Canada or the United States of America who are members of recognized dental or orthodontic organizations.

#### **B. Attendance Fee—\$10.00.**

1. Associate or junior members of constituent societies of the American Association of Orthodontists.
2. Recent graduates of university orthodontic departments who are in Government Service.

#### **C. Attendance Fee—\$20.00.**

1. Recent graduates of university orthodontic departments who are not members of constituent societies of the American Association of Orthodontists.
2. Other guests.

Those persons who would be classified under the heading of C-1 or C-2 above are requested to apply to the chairman of the Credentials Committee at least sixty days before the session for proper forms, which will require (a) written endorsement by two active members of the A. A. O. in the applicant's vicinity, (b) that the applicant be a member in good standing of the American Dental Association, and (c) that the applicant never have been rejected for membership in any of the constituent societies of the A. A. O.

Those persons who would be classified under the headings of A or B would be required only to submit credentials identifying themselves as being in one of these categories at the time of registration. Advanced reservations, which are by far most desirable, can be applied for by clearing one's credentials with the Credentials Committee by March 1, 1958.

Registration under categories C-1 and C-2 will, of necessity, be limited.

*C. Sterling Conover*  
Chairman of the Credentials Committee  
1 East 57th St.  
New York, New York

**Ladies Program at 1958 Meeting of American Association of Orthodontists****Commodore Hotel, New York, N. Y.****April 27-May 1, 1958***Sunday, April 27*

10-5

**Ladies Registration. Grand Ballroom Foyer.**

A member of the Ladies Entertainment Committee will be at the registration desk in the Grand Ballroom Foyer to help in the completion of your plans or to make plans for the following days and evenings of the meeting.



**Empire State Building.** This is the tallest building in the world, rising 1,472 feet or 102 stories into the air. From the observatory on the eighty-sixth floor one can see a diameter of 60 to 80 miles, an area in which one of every ten Americans lives and works. The glass-enclosed upper observatory on the 102nd floor offers another and different view of New York City and its environs. (Courtesy New York Convention and Visitor's Bureau.)

A lady from the New York Convention and Visitor's Bureau will be present to help with tours and information regarding places to dine or shop and will advise as to attendance at radio or TV broadcasts.

6

**Get-Acquainted Cocktail Party.***Monday, April 28*

9-11:30

**Ladies Registration. Grand Ballroom Foyer.**

Ladies are invited to attend all scientific sessions (admission by badge). During Monday morning's session (see program for time), a wonderful treat is in

store for the members and their ladies when the renowned Rev. Dr. Norman Vincent Peale speaks and when Prof. James Neal discusses the much publicized subject of "X-ray Radiation and Genetics."

12:30 Luncheon and Fashion Show.

The beautiful Empire Room of the Waldorf-Astoria will be the scene of a delicious luncheon and a wonderful fashion show to be given by Miss Fontayne, designer, of New York. She will show her exclusive collection of late spring and summer fashions, completely accessorized. There will be favors, music, and two exciting door prizes, each for two seats for "My Fair Lady" for Monday evening.

Cocktails before luncheon will be available at the tables or in the famed Peacock Lounge near the main lobby.

Attendance limited—tickets necessary.



Brilliant lights illuminate the Times Square area at night. Spectacular electric signs, together with theater marquees displaying thousands of electric bulbs, make this section of the city one of the brightest spots anywhere. This part of Broadway is the theatrical center of America, where the top dramas, musicals, motion pictures, radio and television shows are presented. (Courtesy New York Convention and Visitor's Bureau.)

*Tuesday, April 29*

10:30-1 Ladies Registration. Grand Ballroom Foyer.

9-11 Complimentary Continental Breakfast in the East Ballroom. Attendance limited—tickets necessary.

As everyone coming to New York has a particular interest in something special, the balance of the day has been left open for your own plans. The members of the committee at the registration desk and the representative of the New York Convention and Visitor's Bureau will help you complete your plans and will aid in advising the proper agency to contact for tours, sight-seeing, or shopping. Some suggestions are: a trip to the nearby United Nations, visits to museums,

the Planetarium, a trip around Manhattan by boat or by sight-seeing bus. These can be arranged upon your arrival in New York. Information about TV and radio broadcasts, shops, and restaurants, will also be available.

*Wednesday, April 30*

9-1 Ladies Registration. Grand Ballroom Foyer.

It is suggested that you plan this day for luncheons, matinees, or movies.

**IMPORTANT!** Tickets for theaters must be arranged for far in advance through your own theater ticket agency, the theater box office, or Tyson and Sullivan Theatre Ticket Service whose questionnaire you have received. Your reserved tickets may be picked up at their branch office in the Commodore Hotel.

6:30 President's Reception.

We shall be the guests of the Northeastern Society of Orthodontists for cocktails.

Banquet and dance in the Grand Ballroom. Songs by the internationally famous Yale University "Whiffenpoofs." Dancing to the music of Tony Cabot and his Victor Recording Orchestra.

*Ladies Entertainment Committee*

Dr. Norman L. Hillyer, Chairman

Mrs. Norman L. Hillyer, Co-Chairman

*Executive Committee:*

Mrs. Herbert H. Ernst  
Mrs. Wilbur J. Prezzano  
Mrs. Franklin A. Squires  
Mrs. Donald B. Waugh

*Committee:*

Dr. Josephine M. Abelson  
Mrs. Philip E. Adams  
Mrs. George M. Anderson  
Mrs. Ernest N. Bach  
Mrs. Robert M. Bailey  
Mrs. Henry C. Beebe  
Mrs. Alfred J. Braida  
Mrs. Horace P. Clark  
Mrs. C. Sterling Conover  
Mrs. John J. Dolce  
Mrs. Stanley M. Dow  
Mrs. Clifford G. Glaser  
Mrs. Irving Grenadier  
Mrs. Ashley E. Howes  
Mrs. Donald Hutchinson  
Mrs. William R. Joule  
Mrs. Richard A. Lowy

Mrs. C. Edward Martinek  
Mrs. David Mossberg  
Mrs. Walter H. Mosmann  
Mrs. Edward G. Murphy  
Mrs. Donald D. Osborn  
Mrs. Lowrie J. Porter  
Mrs. J. A. Salzmman  
Mrs. Earl E. Shepard  
Mrs. George H. Siersma  
Mrs. Henry Spiller  
Mrs. Brainerd F. Swain  
Mrs. John R. Thompson  
Mrs. Everett A. Tisdale  
Mrs. Leuman M. Waugh  
Mrs. Faustin H. Weber  
Mrs. Raymond L. Webster

**Scientific Program for the Fifty-fourth Annual Meeting of the American Association of Orthodontists, April 27 to May 1, 1958,  
Commodore Hotel, New York City**

*Sunday, April 27*

10 A.M. to  
5 P.M.

Registration. Main Ballroom Foyer.

*Monday, April 28*

*Opening Session*

9:30 A.M.

Official opening of the meeting. President Squires.

Invocation. Dr. Arthur Stanley Wheelock, Church of the Highlands, White Plains, New York.

Address of Welcome. Percy T. Phillips, President-Elect of the American Dental Association.

Response. C. Edward Martinek, President-Elect of the American Association of Orthodontists.

President's Address. Franklin A. Squires.

*Scientific Session*

(Presiding—John R. Thompson, Program Committee Chairman)

10:30 A.M.

The Responsibility of the Professional Person to His Patients, Society, and Himself. Dr. Norman Vincent Peale, Minister, Marble Collegiate Church, New York City.

11:15 A.M.

Radiation and Genetics. James V. Neel, Professor of Human Genetics and Chairman of the Department, University of Michigan Medical School.

12:15 P.M.

Golden Anniversary Luncheon.

2 P.M.

Presentation of the Albert H. Ketcham Memorial Award of the American Board of Orthodontics. Presentation by Lowrie J. Porter, President, The American Board of Orthodontics. Acceptance by Joseph Davis Eby and H. Carlyle Pollock, Sr.

*Scientific Session*

(Presiding Chairman—Clifford G. Glaser, President,  
Northeastern Society of Orthodontists)

**SYMPOSIUM ON SERIAL EXTRACTION PROCEDURES**

(The purpose of this symposium is to bring together the points of view of a number of outstanding exponents of this important but controversial subject.)

2:30 P.M.

Introduction: Current Concepts on Serial Extraction in Orthodontic Treatment.  
B. F. Dewel, Evanston, Illinois.

3:15 P.M.

Collaboration:

1. Serial Extraction as a Treatment Procedure. Z. Bernard Lloyd, Washington, D. C.
2. Research Studies on Serial Extraction. Kenneth C. Marshall, St. Louis, Missouri.
3. Why Serial Extraction? Warren R. Mayne, Salem, Massachusetts.

4:45 P.M.

The Treatment of Anterior Open Bite Malocclusion Associated With Unfavorable Facial Skeletal Pattern. J. William Adams, Indianapolis, Indiana.

*Tuesday, April 29**Scientific Session*

(Presiding Chairman—George H. Siersma, Vice-President,  
American Association of Orthodontists)

## DISCUSSION SYMPOSIUM

(The purpose of this symposium is to bring together the opinions of scientists and clinical orthodontists on a current, controversial subject in orthodontics.)

9 A.M.

## Introduction of the Subject:

The Lower Incisor—Its Influence on Treatment and Esthetics.

John T. Lindquist, Indianapolis, Indiana.

(This paper, an American Board thesis for 1957, was published in the February issue of the AMERICAN JOURNAL OF ORTHODONTICS so that the audience would have the opportunity to study it in advance of the meeting.)

## Discussion of the Subject:

## 1. From the Viewpoint of Anthropology.

Wilton M. Krogman, Ph.D., Professor of Physical Anthropology, University of Pennsylvania, Director of The Philadelphia Center for Research in Child Growth, Philadelphia, Pennsylvania.

## 2. From the Viewpoint of Growth.

Harry Sicher, M.D., Professor of Anatomy, Chicago College of Dental Surgery, Loyola University, Chicago, Illinois.

## 3. From the Viewpoint of Orthodontics.

Wendell L. Wylie, Professor of Orthodontics, University of California and practitioner of Orthodontics, San Francisco, California; Secretary, American Board of Orthodontics.

10:45 A.M.

Milo Hellman Research Award. Reading of the Prize Winning Essay and presentation of the award by President Squires.

11:30 A.M.

First Business Meeting.

12:30 P.M.

Past-President's Luncheon.

*Research Section*

(Presiding Chairman—J. William Adams)

1:30 P.M.

Research Reports. A supplement to this program, issued at the time of registration, will contain the details of this phase of the program. Each report will be limited to 10 minutes.

*Wednesday, April 30*

9 A.M.

Table Clinic Session. William R. Joule, Chairman.

12 M.

Round-Table Discussion Luncheon. Horace P. Clark, Chairman.

## Subjects:

1. Serial Extraction Therapy

2. Extraoral Therapy

3. Relapse Cases
4. Cephalometric Radiography
5. General Discussion

2 P.M.

First Appliance Therapy Panel Session  
and  
First Limited Attendance Clinic Session.

3:30 P.M.

Second Appliance Therapy Panel Session  
and  
Second Limited Attendance Clinic Session.

*Appliance Therapy Questions:*

1. How do you move maxillary canines distally in first bicuspid extraction cases?
2. How do you reinforce maxillary anchorage in the retraction of maxillary canines?
3. How do you maintain anchorage in the mandibular arch while exerting traction posteriorly on maxillary teeth?
4. How do you move teeth vertically to establish desired occlusal levels in deep or excessive overbite cases?

*Panelists:*

2 P.M.

Group 1 (Presiding Chairman—Richard A. Lowy).

1. Paul D. Lewis, Seattle, Washington.
2. Harry L. Bull, Jersey City, New Jersey.
3. Ralph E. Braden, Memphis, Tennessee.
4. G. Vernon Fisk, Toronto, Canada.

3:30 P.M.

Group 2 (Presiding Chairman—Ernest L. Johnson).

1. Joseph R. Jarabak, Chicago, Illinois.
2. H. K. Terry, Miami, Florida.
3. Howard Yost, Grand Island, Nebraska.
4. William L. Wilson, Boston, Massachusetts.

*Thursday, May 1*

*Scientific Session*

(Presiding—Joseph D. Eby, Past-President, American Association  
of Orthodontists)

9 A.M.

Re-evaluating Our Relapses.  
Robert R. McGonagle, Euclid, Ohio.

9:45 A.M.

Symposium on Extraoral Therapy.

*Introduction:*

A Present-Day Evaluation of the Analysis and Therapy of the Extraoral  
Anchorage Application in the Treatment of Class II Malocclusions,  
Silas J. Kloehn, Appleton, Wisconsin.

## Collaboration:

## Total Extraoral Therapy.

James Jay, New York, New York.

The Use of Extraoral Anchorage as a Clinical Aid to Reduce or Avoid the Need for Intermaxillary Elastic Traction.

Waldo O. Urban, Evanston, Illinois.

11:30 A.M.

## Report on the Roentgenographic Cephalometric Workshop.

Résumé of the Workshop and Limitations of the Technic.

J. A. Salzmänn, New York, New York.

Requisites and Criteria of the Technic.

T. M. Graber, Chicago, Illinois.

Validation of the Technic.

Wilton M. Krogman, Philadelphia, Pennsylvania.

12:15 P.M.

## Second Business Meeting.

Installation of Officers.

Presentation of the Past-President's Key to

Franklin A. Squires by A. C. Broussard.

---

**Northeastern Society of Orthodontists**

The Northeastern Society of Orthodontists will hold its annual business meeting at the Commodore Hotel in New York City on Tuesday, April 29, 1958. There will be no scientific meeting of the Society, since the American Association of Orthodontists will be meeting in New York at that time.

---

**Pacific Coast Society of Orthodontists\***

The Northern Component meets on the second Tuesday of March, June, September, and December.

The Central Component meets on the second Tuesday of March, June, September, and December.

The Southern Component meets on the second Friday of March, June, September, and December.

*Northern Component*

On Monday morning, Nov. 11, 1957, the meeting was held at the new University of Oregon Dental School in Portland. President Jim Keenan read the Pledge to four of the new members: John P. Anderson, Walter Doering, Joe Moran, and Jerry Schulz.

The clinical program was opened by Dick Philbrick of Seattle, who discussed a method of anterior space closure following active treatment. The technique involved a heavy labial 0.036 arch, and an anterior acrylic button covering the four anterior teeth with Plexiglas hooks for the attachment of a high headgear. The typical retainers were suggested for final settling.

The program continued with a presentation by Bertram Kraus, physical anthropologist and recent addition to the Orthodontic Department of the University of Washington. Dr. Kraus began his discussion by explaining the regularity with which various parts of the body

---

\*Excerpts from the *Bulletin* of the Pacific Coast Society of Orthodontists.

grow with respect to others. He noted that equations have been devised to explain some of the phenomena of growth and inferred that in orthodontics we may someday be able to predict rates and directions of growth early enough to intercept developing malocclusions.

The afternoon program was opened by Herbert Foster of Oakland, California, who read a soon-to-be-published treatise on the subject of "The Accuracy of Predictions Made from Studies of Mixed Dentition." The work mentioned was done at the University of California with Wendell Wylie and consisted of predicting the sizes of arches and teeth from formulas and x-rays and then measuring the actual arches and permanent tooth widths from final record models. The inaccuracies discovered in the various phases of the project lead to the conclusion that borderline discrepancies should be handled cautiously.

The Nominations Committee presented their recommendations for new officers:

*Director to the P. C. S. O.*, Dick Philbrick  
*Alternate Director*, Richard Cline  
*Chairman*, Kenneth S. Kahn  
*Sec'y-Treasurer (two years)*, Robert Kemp

A unanimous ballot was cast in favor of the report.

### *Central Component*

The meeting held at the Fraternity Club on Dec. 11, 1957, was called to order by Chairman Oliver Hartman.

The afternoon portion of the meeting was devoted to a paper presented by Dr. T. M. Graber of Northwestern University, entitled "Finger-Sucking and Associated Muscular Perversions." In this paper, Dr. Graber discussed the various effects of finger-sucking and made suggestions for the management of this problem. Following the paper there was a panel discussion moderated by William S. Smith. Members of the panel consisted of Dr. Maurice Kaplan, a San Francisco psychiatrist, who discussed Dr. Graber's paper from the standpoint of psychiatric problems involved; Everett Watkins, who discussed the management of these problems from the standpoint of the orthodontist and called attention to the comparatively short time that the orthodontist has to intervene in these problems if they are to be successfully corrected; Walter Straub, who discussed the problems from the standpoint of perverted swallowing habits associated with the finger-sucking; and Wendell Wylie, who discussed the patient's response and enthusiasm in relation to orthodontic treatment.

After these discussions, a series of questions from the members were discussed by the panel. This was one of the most successful meetings that the Central Component has had.

Following the social hour there was dinner, following which William S. Smith, assuming his annual role as Santa Claus, distributed "valuable" gifts to all, following which he paid special tribute to Raymond Curtner, pointing out the tremendous amount of time and service that he has given to dentistry and to orthodontics in particular. Ray will retire as secretary-treasurer of the Pacific Coast Society of Orthodontists following the Santa Barbara meeting.

Program Chairman William S. Parker called the special attention of the group to a table clinic demonstration which was set up by Herbert Foster, Warren Kitchen, Paul Fleming, and Ronald Koster. This group of men showed cases which had unique diagnostic problems and cases which were in the process of being treated, as well as cases which had been successfully treated. This portion of the program is becoming extremely popular and will be continued next year.

At the business part of the meeting Arnold Wieser announced that on Sunday, Feb. 23, 1958, there will be a golf tournament in connection with the meeting at Santa Barbara. The tournament is to begin at noon. Information concerning the tournament will be mailed before the date of the meeting to those interested.

George Hahn, reporting for the Membership Committee, recommended that the following men be elected to Associate Membership:

Stanley Y. Inouye  
Bertram Kronen  
Gareth L. Meinhold

Richard J. Muir  
Edmond L. Senty

Chairman Hartman called for a vote and these men were elected to Associate Membership.

George Hahn then recommended that the following men be recommended to the Board of Directors for regular membership in the Pacific Coast Society of Orthodontists:

Maurice A. Bliss  
Roy James Bourquin  
Burton E. Coleman  
Blaine S. Clements  
Robert G. Daniel  
Wayne M. Hopp  
Shinso Kagawa  
Ronald W. Koster

Hillard I. Lerner  
Lowell C. Lundell  
Harold L. Odden  
Archie E. Peterson  
Donald A. Rudee  
Robert E. Sprott  
James LaForrest Thurston  
George Uesato

The recommendation of the Membership Committee was approved.

Reporting for the Nominating Committee, Charles Konigsberg presented their recommendations to the group:

*Chairman*, William S. Parker  
*Program Chairman*, Walter Straub  
*Secretary-Treasurer*, Eugene E. West  
*Alternate director to the*  
*Pacific Coast Society of Orthodontists*, Raymond Curtner

It was moved and seconded that these men be elected to office for the ensuing year, and the motion was carried.

### *Southern Component*

The Southern Component met at the Huntington-Sheraton Hotel in Pasadena at 10 A.M. on Thursday, Dec. 12, 1957.

The meeting was called to order by Chairman Roscoe Keedy. T. F. Graber was introduced and began his discussion of the cleft palate problems. This included a résumé of results obtained and expected. He emphasized the need for surgical timing and teamwork by various professional groupings.

After lunch, Dr. Graber discussed retention and its problems and prospects. He deserves commendation for his candid and practical approach.

The minutes for September were read and accepted.

The following officers were nominated and elected for the 1958 term:

*Chairman*, Burton Fletcher  
*Treasurer*, Sydney Meek  
*Secretary*, Charles Linfesty

### *P. C. S. O. Past-President Retires*

Closing his office door for the last time on December 11, Harvey A. Stryker of Paso Robles joined the ranks of his colleagues who bask in the sunshine of comfort and relaxation, viz., retirement.

Dr. Stryker graduated in 1915 from the University of Pennsylvania, where he served as president of its Honor Society in his junior and senior years. Following this, he started practice in Rochester, New York. In 1919 he attended the Dewey School of Orthodontia in

New York. Then he moved to Santa Ana, California, where in 1921 he started the exclusive practice of orthodontics. In 1934 he moved to San Francisco where he practiced until 1952, when he located in Paso Robles to practice on a limited basis.

While in Santa Ana, he was a member of the lecture staff of the University of Southern California under our distinguished colleague, James D. McCoy. "One of the highlights of my career" says Dr. Stryker, "was the inspiration derived from several years of close association with Dr. McCoy."

He was president of our Society in 1930-32, he is a diplomate of the American Board of Orthodontics and a member of the Omicron Kappa Upsilon honor fraternity.

### *Secretary-Treasurer Retires From Position*

After five years of faithful and efficient service to our Society as Secretary-Treasurer, Raymond Curtner will not be continuing in that office.

During the period he has been in office we have seen our Society thrive and develop into one of the leading constituent societies in the nation. The record keeping and financial management incidental to the large and rapid increase in our membership has been most capably handled in Ray's office. This, for the most part, has been responsible for your Society's successful progress.

It is evident that an editor relies upon no other person in the Society to a greater extent than the secretary-treasurer. I can say in all sincerity that because of Ray's efforts the task of placing our *Bulletin* in your hands each quarter has been greatly facilitated.

Your editor considers himself extremely fortunate in having enjoyed the cooperation, dependability, and efficiency of such a man.

Happy relaxation, Ray, and my heartfelt appreciation.

*Reuben L. Blake*

### *Reuben Lloyd Blake*

The *Bulletin* of the Pacific Coast Society of Orthodontists, Vol. 9, No. 2, Dec. 1, 1933, introduced a new format to the publication and a new editor.

Reuben Lloyd Blake, D.D.S., a graduate of the College of Physicians and Surgeons in 1926 and a graduate of the Dewey School of Orthodontics in New York in 1926, returned to his native San Francisco and immediately began his untiring efforts in behalf of dentistry and especially in behalf of the relatively new profession of orthodontics.

It is difficult for one who has known and has been close to Reuben for more than thirty years to review his professional accomplishments without becoming maudlin and statistically boring in reciting his numerous contributions to his profession, his Alma Mater, his community, and his hobbies, especially his love of art.

His home, presided over by his gracious and understanding wife, Lillian, is a beautiful and peaceful home where Rube has always spent every spare hour during his fabulous career.

As a life member of the Commonwealth Club of California, he is well versed in civic, local, state, and national affairs. He is also a life member of the Press Club of San Francisco.

His hobbies over the years include golf, fishing, gardening, photography, extensive traveling and, most important of all, his drawings of dogs. The touch of the master artist is seen in his work and he has exhibited his original drawings at the Civic Center Art Exhibit, sponsored by the San Francisco Art Commission, and also at the Palace of the Legion of Honor and the M. H. de Young Museum. He is an honorary life member of the Society of Western Artists.

This is a thumbnail sketch of the man who is resigning as editor of the *Bulletin* and as Librarian of the Pacific Coast Society of Orthodontists.

Truly the old saying, "Give a busy man a job and it will be done," is aptly exemplified in Rube.

His host of friends wish him and his lovely Lillian long years of happiness in his retirement from active professional participation in our association and in our profession.

*Fred T. West*

Past-President, A. A. O.

P. C. S. O. *Bulletin*, Vol. 33, No. 4, dated December, 1957, ends twenty-six consecutive years with a tribute to a truly wonderful person, our editor, Reuben Lloyd Blake.

*Raymond M. Curtner*

Secretary-Treasurer, P. C. S. O.

---

### **Necrology Committee**

#### **American Association of Orthodontists**

Please notify the Necrology Committee of the death of any of our members. This information should be sent immediately to the chairman or to any member of the Committee.

*Ernest N. Bach*, Chairman

305 Professional Bldg.

Toledo, Ohio

---

### **Southern Society of Orthodontists**

The thirty-seventh annual meeting of the Southern Society of Orthodontists will be held aboard the luxury cruise ship "M. V. Arosa Sky."

The ship will leave Norfolk, Virginia, on Sunday, Oct. 19, 1958, for Bermuda, W. I. It will return from Bermuda, docking at Norfolk, Virginia, on Friday, October 24.

---

### **Johnson Alumni Club**

The January, 1958, meeting of the Johnson Alumni Club, held at Louisville, Kentucky, registered the largest attendance in the Club's history. Members attended from every state in the U. S. A. and from several foreign countries.

*Cecil G. Muller*, Secretary

Johnson Alumni Club.

---

### **British Society for the Study of Orthodontics**

The British Society for the Study of Orthodontics is celebrating its Fiftieth Jubilee in May, 1958. The two-day conference will be held at the Eastman Dental Hospital, London, and the program will consist of papers on Friday, May 9, and Saturday morning, May 10, with table demonstrations on Saturday afternoon, May 10. A dinner will be held at the Savoy Hotel on Friday evening.

Nonmembers will be allowed to attend the conference on payment of the subscription of one guinea.

Further details may be obtained from the Secretary, Mr. H. Lester Leech, The Dental Department, Peace Memorial Hospital, Watford, Herts.

### **Dr. Leo M. Shanley Honored**

A citation of merit was recently awarded by Washington University, St. Louis, Missouri, to Dr. Leo M. Shanley.

The citation, awarded in appreciation of valuable contributions to the welfare of the University, was presented on the University's Founders' Day, Feb. 21, 1958.

---

### **Orthodontic Directory of the World**

Information blanks have been sent out for the 1958 edition of the *Orthodontic Directory of the World*. If anyone eligible for listing has not returned his information blank, he is urged to do so at once. Those who have not received the blanks may write the *Orthodontic Directory of the World*, 1915 Broadway, Nashville 4, Tennessee, requesting an information blank for possible eligibility.

---

### **University of Rochester**

The University of Rochester, School of Medicine and Dentistry, offers opportunities for graduate work and research in the dental sciences. A number of fellowships are now available to dental graduates who are interested in research and additional training in the sciences fundamental to dentistry. Candidates will be selected on the basis of scholastic record, promise in research, and genuine interest in an academic career in dentistry.

Accepted candidates who qualify for admission to the Graduate School may prepare themselves for the M.S. or Ph.D. degree in one of the following sciences: anatomy, bacteriology, biochemistry, pathology, pharmacology, physiology, and radiation biology.

Opportunities to work for the M.S. degree with a major in dental science are also available. This program may be combined with clinical training.

---

### **University of Alabama**

The University of Alabama, School of Dentistry, announces a course in "Removable Orthodontic Appliance Construction" to be given on May 24, 25, and 26, 1958, by Dr. Samuel Gore.

The course, which is limited to practicing orthodontists, will be given at the School of Dentistry, Birmingham, Alabama.

---

### **USAF's General Kennebeck Retires**

Major General Marvin E. Kennebeck, Assistant for Dental Services, Office of the USAF Surgeon General, was awarded the Legion of Merit in retirement ceremonies on Jan. 31, 1958. Brigadier General James S. Cathroe was named as the new Assistant for Dental Services.

General Kennebeck was appointed Assistant for Dental Services in June, 1952, where he pioneered in the fluoridation of water supplies at Air Force bases, the initiation of the Air Force Preventive Dentistry Program which has contributed immeasurably to the high health standards of the Air Force, the introduction of the Panoramic Dental X-Ray machine, and the use of chrome cobalt alloy to replace gold in dental work. In addition, during General Kennebeck's assignment dental officer and postgraduate training was expanded by over 100 per cent, which affords the highest type of professional training to

Air Force dental officers. This has resulted in a marked increase in officer morale, retainability, and procurement. All of the above accomplishments have resulted in vast savings in the operation of the Air Force Dental Service.

---

### U. S. Department of Health, Education, and Welfare

The 1960 White House Conference on Children and Youth should be planned to assess the needs of children in a rapidly changing world, a group of physicians told the Children's Bureau at a meeting on Feb. 19, 1958.

The physicians were consulted by Mrs. Katherine B. Oettinger, Chief of the Bureau, in the first of a series of technical conferences with members of various professions interested in children to discuss their particular areas of interest in the forthcoming conference.

Those participating included obstetricians, pediatricians, general practitioners, psychiatrists, medical educators, and public health physicians.

Dr. Stewart H. Clifford, Brookline, Massachusetts, President, American Academy of Pediatrics, said that he had asked about eighty pediatricians, including past Academy presidents and members of the Academy's executive board, to give him their suggestions as individuals concerning the 1960 conference.

The responses, he said, underlined the need to take cognizance of "vast new influences" which affect the lives of children. He suggested that the conference have the twin objective of strengthening family life and helping parents to increase their confidence as parents.

"We have had a greatly increased child population in the past ten years," Dr. Clifford said. "This will probably not diminish in the immediate future. If the times are confusing and perplexing to many young parents, more attention must be given to educating and supporting them through effective counseling by those who serve children and parents."

Dr. Clifford said that he thought parents "should learn to have less complete dependence on the professions. The professions should help parents in such a way that the parents grow more rather than less independent by that relationship."

Dr. Charles Janeway, Boston, Massachusetts, professor of pediatrics at Harvard University, said, "No country has produced a material civilization to compare with ours. But I am not at all convinced we have a happier population than any other country I've visited.

"We are creating vast suburban communities with people of the same age group, the same motivations, and the same aspirations," Dr. Janeway said. "These are not communities any more but just one vast gray sameness."

He pointed to the need to examine our institutions to see how they are really serving not only the physical but the total human needs of the country's children and cited such institutions as schools, our natural resources, our concepts of recreation, and our housing.

"Our great cities have become communities of as many as 30 million people," he said, "but we have no over-all plan to see that everything is done to meet the deep-seated human needs of the people who live in them."

The Children's Bureau will hold similar advisory meetings in the future with other professional groups.

---

### American Association for Cleft Palate Rehabilitation

The American Association for Cleft Palate Rehabilitation will hold its sixteenth annual convention at the St. Francis Hotel in San Francisco, California, on Thursday, Friday, and Saturday, April 24 to 26, 1958.

### Notes of Interest

Dr. D. G. Andronaco announces the removal of his office to the Elmwood Medical Center, 1351 Mount Hope Ave., Rochester, New York.

Dr. J. E. McDermott announces that Dr. D. L. Donovan is associated with him in the exclusive practice of orthodontics, 407 Hofmann Bldg., Ottumwa, Iowa.

Joseph K. Tucker, D.D.S., announces the removal of his office to Professional Center, 1846 Merrick Ave., Merrick, Long Island, New York, practice limited to orthodontics.

---

Forthcoming meetings of the American Association of Orthodontists:

1958—Commodore Hotel, New York, New York, April 27 to May 1.

1959—Statler Hotel, Detroit, Michigan, May 4 to 7.

1960—Shoreham Hotel, Washington, D. C., April 24 to 28.

1961—Denver, Colorado.

1962—Los Angeles, California.

## OFFICERS OF ORTHODONTIC SOCIETIES

The AMERICAN JOURNAL OF ORTHODONTICS is the official publication of the American Association of Orthodontists and its component societies. The Editorial Board of the JOURNAL is composed of a representative of each of the component societies.

### American Association of Orthodontists

(Next meeting April 27-May 1, 1958, New York)

*President*, Franklin A. Squires - - - - - Medical Centre, White Plains, N. Y.  
*President-Elect*, Edward C. Martinek - - - - - Fisher Bldg, Detroit, Mich.  
*Vice-President*, George H. Siersma - - - - - Republic Bldg., Denver, Colo.  
*Secretary-Treasurer*, Earl E. Shepard - - - - - 8230 Forsyth, St. Louis, Mo

### Central Section of the American Association of Orthodontists

(Next meeting Sept. 29-30, 1958, Cedar Rapids)

*President*, Frederick B. Lehman - 1107 Merchants National Bank Bldg., Cedar Rapids, Iowa  
*Secretary-Treasurer*, William F. Ford - - - - - 575 Lincoln Ave., Winnetka, Ill.  
*Director*, Elmer F. Bay - - - - - 216 Medical Arts Bldg., Omaha, Neb.

### Great Lakes Society of Orthodontists

(Next meeting Nov. 2-5, 1958, Pittsburgh)

*President*, Edwin G. Flint - - - - - 8047 Jenkins Arcade, Pittsburgh, Pa.  
*Treasurer*, D. C. Miller - - - - - 40 South Third St., Columbus, Ohio  
*Director*, Robert E. Wade - - - - - 327 E. State St., Columbus, Ohio

### Middle Atlantic Society of Orthodontists

(Next meeting Oct. 12-14, 1958, Atlantic City)

*President*, Gerard A. Devlin - - - - - 121 Prospect St., Westfield, N. J.  
*Secretary-Treasurer*, Paul A. Deems - - - - - 835 Park Ave., Baltimore, Md.  
*Director*, George M. Anderson - - - - - 3700 North Charles St., Baltimore, Md.

### Northeastern Society of Orthodontists

(Next meeting April 29, 1958, New York)

*President*, Clifford G. Glaser - - - - - 1255 Delaware Ave., Buffalo, N. Y.  
*Secretary-Treasurer*, David Mossberg - - - - - 36 Central Park S., New York, N. Y.  
*Director*, Norman L. Hillyer - - - - - 230 Hilton Ave., Hempstead, L. I., N. Y.

### Pacific Coast Society of Orthodontists

*President*, Richard Railsback - - - - - 1333 Grand Ave., Piedmont, Calif.  
*Secretary-Treasurer*, Warren Kitchen - - - - - 2037 Irving St., San Francisco, Calif.  
*Director*, Richard Railsback - - - - - 1333 Grand Ave., Piedmont, Calif.

### Rocky Mountain Society of Orthodontists

(Next meeting Sept. 7-9, 1958, Moran, Wyo.)

*President*, George E. Ewan - - - - - Bank of Commerce Bldg., Sheridan, Wyo.  
*Secretary-Treasurer*, H. Carlyle Pollock, Jr. - - - - - 915 South Colorado Blvd., Denver, Colo.  
*Director*, Ernest T. Klein - - - - - Republic Bldg., Denver, Colo.

### Southern Society of Orthodontists

*President*, John A. Atkinson - - - - - 898 Starks Bldg., Louisville, Ky.  
*Secretary-Treasurer*, H. K. Terry - - - - - 2742 Biscayne Blvd., Miami, Fla.  
*Director*, Edgar Baker - - - - - Professional Bldg., Raleigh, N. C.

### Southwestern Society of Orthodontists

(Next meeting Oct. 5-8, 1958, Little Rock)

*President*, Thermon B. Smith - - - - - 1122 W. Capitol, Little Rock, Ark.  
*Secretary-Treasurer*, Harold S. Born - - - - - 908 S. Johnstone, Bartlesville, Okla.  
*Director*, Nathan Gaston - - - - - 701 Walnut St, Monroe, La.

### American Board of Orthodontics

*President*, Lowrie J. Porter - - - - - 41 East 57th St., New York, N. Y.  
*Vice-President*, William R. Humphrey - - - - - Republic Bldg., Denver, Colo.  
*Secretary*, Wendell L. Wylie - - - - - University of California School of Dentistry,  
The Medical Center, San Francisco, Calif.  
*Treasurer*, Jacob A. Salzmann - - - - - 654 Madison Ave., New York, N. Y.  
*Director*, L. Bodine Higley - - - - - University of North Carolina, Chapel Hill, N. C.  
*Director*, B. F. Dewel - - - - - 708 Church St., Evanston, Ill.  
*Director*, Frank P. Bowyer - - - - - 608 Medical Arts Bldg., Knoxville, Tenn.



There is an apparent discrepancy

The pages are either missing or the

The filming is recorded as the book

ancy at this point.

or the pagination is incorrect.

e book is found in the collections.





# TWINS AT ADERER



## TWIN BRACKETS—Edgewise

with soldered backs for precision mounting

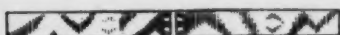
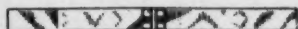
Short (.091")

Medium (.140")

Long (.170")

## STRAIGHT TEMPERABLE BAND STRIPS WITH TWIN BRACKETS

—Edgewise—



Ordering  
Code No.

G-1TN .003" x .125" x 1 3/4" (narrow)

G-1TM .003" x .125" x 1 3/4" (medium)

G-1TL .003" x .125" x 1 3/4" (long)

G-2TN .004" x .125" x 1 3/4" (narrow)

G-2TM .004" x .125" x 1 3/4" (medium)

G-2TL .004" x .125" x 1 3/4" (long)

G-16TN .004" x .094" x 1 3/4" (narrow)

G-16TM .004" x .094" x 1 3/4" (medium)

G-16TL .004" x .094" x 1 3/4" (long)

Ordering  
Code No.

G-17TN .003" x .094" x 1 3/4" (narrow)

G-17TM .003" x .094" x 1 3/4" (medium)

G-17TL .003" x .094" x 1 3/4" (long)

G-18TN .004" x .125" x 2" (narrow)

G-18TM .004" x .125" x 2" (medium)

G-18TL .004" x .125" x 2" (long)

G-19TN .005" x .094" x 1 3/4" (narrow)

G-19TM .005" x .094" x 1 3/4" (medium)

G-19TL .005" x .094" x 1 3/4" (long)

## CONTOUR BAND STRIPS WITH TWIN BRACKETS

(All Made of Temperable Precious Metal)



### ANTERIOR CONVEX BAND STRIP\*

G-7TN .004" x 1/4" x 1 3/4" (narrow)

G-7TM .004" x 1/4" x 1 3/4" (medium)

G-7TL .004" x 1/4" x 1 3/4" (long)

### BICUSPID CONTOURED STRIP\*\*

G-9TN 1 3/4" long (narrow)

G-9TM 1 3/4" long (medium)

G-9TL 1 3/4" long (long)

### CUSPID CONTOURED STRIP\*\*

G-12TN 1 3/4" long (narrow)

G-12TM 1 3/4" long (medium)

G-12TL 1 3/4" long (long)

### MOLAR CONTOURED STRIP\*\*

G-14TN 2 1/4" long (narrow)

G-14TM 2 1/4" long (medium)

G-14TL 2 1/4" long (long)

\*Designed by Dr. J. W. Adams

\*\*Designed by Dr. W. B. Downs

# NEW

## BRACKETS Edgewise WITH DOUBLE ROTATING ARMS



These brackets, designed by Dr. Paul D. Lewis, are particularly useful to increase stability from three points of contact.

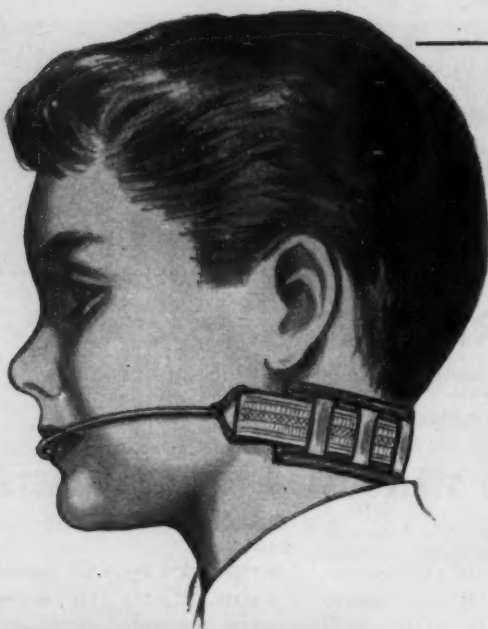
Like all Aderer precious metal brackets, they are machined to the close tolerance of fine precision instruments, are extremely strong and high fusing. Available in short or long; also mounted on straight or contoured band strips.

SEND FOR ILLUSTRATED PRICE LIST

## JULIUS ADERER, INC.

21-25 — 44TH AVENUE  
LONG ISLAND CITY 1, N. Y.

5 SOUTH WABASH AVENUE  
CHICAGO 3, ILLINOIS



## ORTHOBAND

**Adjustable  
Cervical Traction Braces  
and**

## ORTHOPAD

### Foam Rubber Brace Pads

providing varying degrees of force,  
according to type  
of traction brace selected

•

Easy-to-use, quality appliances  
at an economy price

•

**Write for Sample Kit, Order Forms,  
Prices and bibliography  
of articles on extraoral traction  
in A. J. Orthodontics**

•

Also Available . . .

**PATIENT'S APPLIANCE CASE**  
of durable plastic with Goldmark  
name and address identifier.

**ORTHOBAND COMPANY, INC.**  
1000 WASHINGTON AVENUE • ST. LOUIS 1, MO.

**QUALIFIED ORTHODONTIST** for group dental practice, full- or part-time. Experience preferable. California license. Reply to Box MV, American Journal of Orthodontics, 3207 Washington Blvd., St. Louis 3, Missouri.

**ORTHODONTIST**—University trained in the Angle Edgewise technique, excellent background, desires association leading to partnership. Interested in locating in the Midwest or West Coast. Already have several state boards. Please reply to Box JT, American Journal of Orthodontics, 3207 Washington Blvd., St. Louis 3, Missouri.

**NEW YORK ORTHODONTIST** completing two year university graduate training in June 1958, edgewise appliance, desires association, partnership or purchase of practice in New York City or State. Please reply to Box TR American Journal of Orthodontics, 3207 Washington Blvd., St. Louis 3, Mo.

**ORTHODONTIST**—Wanted for full-time association, exclusive downtown Detroit practice. New completely equipped office. Exceptional opportunity. Inquiries in strictest confidence. Reply Box GL, American Journal of Orthodontics, 3207 Washington Blvd., St. Louis 3, Missouri.

**GENERAL PRACTITIONER**, licensed in New Jersey, to assist busy orthodontist one day a week in return for instruction. Reply to Box DL, American Journal of Orthodontics, 3207 Washington Blvd., St. Louis 3, Mo.

**ORTHODONTIST**—California licensed—Completing university training in edgewise technique in June—desires full- or part-time association or location in Southern California. Age 29, military obligation completed. Reply to Box AF, American Journal of Orthodontics, 3207 Washington Blvd., St. Louis 3, Mo.

**ORTHODONTIST** completing university training in edgewise technique, December 1958, desires permanent association, partnership or purchase of established practice in Westchester or Putnam county, northern New Jersey or Connecticut. Reply to Box RV, American Journal of Orthodontics, 3207 Washington Blvd., St. Louis 3, Missouri.

## PRACTICAL PROCEDURES WITH THE TWIN WIRE APPLIANCE

DR. CLAIRE K. MADDEN

This is the course that Dr. Madden gave at  
Columbia University and Utrecht, Holland

\$8.00

Send order with remittance to:

LEO L. BRUDER

1 DeKalb Ave. Brooklyn 1, N. Y.

Specializing in out of print Dentistry

**ORTHODONTIST**—University trained, Edgewise—Twin Arch. Age 35. Excellent background. Desires association, purchase or location in Florida. Replies kept strictly confidential. Please reply to Box RR, American Journal of Orthodontics, 3207 Washington Blvd., St. Louis 3, Missouri.

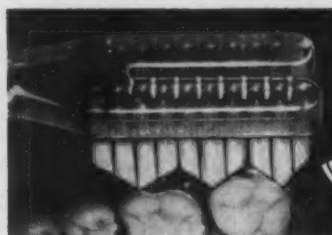
**ORTHODONTIST**—Wanted for part-time or full-time association, exclusive Westchester County practice. Exceptional opportunity for recent graduate. Please send full details. Inquiries will be strictly confidential. Please reply to Box AR, American Journal of Orthodontics, 3207 Washington Blvd., St. Louis 3, Mo.

**CALIFORNIA**—Orthodontist, age 35, married, completing graduate training at the University of Illinois, in or about June, 1958, seeking association in busy orthodontic practice with view to partnership or purchase. Please reply to Box LA, American Journal of Orthodontics, 3207 Washington Blvd., St. Louis 3, Missouri.

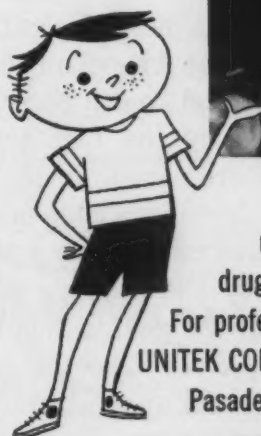
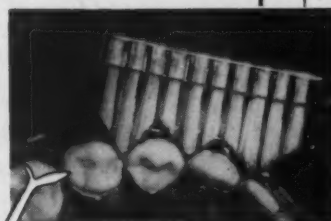
**VACANCY** on accredited orthodontic service in A.D.A. recognized hospital in Brooklyn. Write stating qualifications. Must be university trained. Reply to Box GB, American Journal of Orthodontics, 3207 Washington Blvd., St. Louis 3, Missouri.

BI-PO  
"Shorty"

A new, short bristle,  
contour-trim **ORTHODONTIC**  
brush spaced for embrasures.  
Clears wires.



Adapted to contour.  
Long end-tuft for picking.  
Reaches second molars.  
Children like "shorty".



Free sample on  
request. Send your  
druggist's name & address.

For professional rate, order from  
**UNITEK CORP.**, 275 N. Halstead Ave.,  
Pasadena 8, California



BI-PO COMPANY, BOX 737, PALO ALTO, CALIFORNIA

## THE ENCOURAGEMENT OF PROGRESS

The American Cancer Society's annual Spring Crusade is the climax of its year-round attack on cancer through research, professional and lay education, and service to the stricken. A study of the cancer scoreboard indicates that steady progress is being made. More and more lives are being saved. Progress encourages more progress.

Earlier diagnosis, new methods of treatment and a greater public awareness have contributed to this progress. It is often said that the life of the cancer patient is in the hands of the first physician he consults. The Society, therefore, conducts a broad professional education program, making available to doctors, through literature, films, exhibits, and other materials, information on the latest advances in detection, diagnosis and treatment.

As the Society aids the doctor, so does its large corps of volunteers aid the cancer patient with dressings, transportation, home care, medication and a host of other vitally needed services.

For the past two years, the theme of the Society's annual Crusade has been "Fight Cancer with a Checkup and a Check." That Americans everywhere are learning the value of the annual health checkup in the fight against cancer, is evidenced by the fact that doctors report they are now seeing more cancer in its earliest stages than ever before.

That American men and women have a personal stake in the program of the American Cancer Society is demonstrated by the public's generous support of the Crusade. This year the goal is \$30,000,000 and we are confident that our people will meet the challenge... will "fight cancer with a checkup and a check" in the encouragement of further progress.

Lowell T. Coggeshall, M.D., *President*  
*American Cancer Society*



Save

**TEE\***

and

**SEE**

Use **PRINTED** and **PERSONALIZED**

- ☐ Orthodontic Case Analysis Questionnaires
- ☐ Duplicate Payment Plan Forms
- ☐ School Excuse Slips
- ☐ Head Cap Instructions
- ☐ Letters to the Referring Dentist
- ☐ Care and Use of Retainer Forms

*and*

- ☐ "Orthodontics for my Patients and their Parents"  
(Our popular instructive booklet)

**Our ONLY business is printing Orthodontic booklets and forms,  
personalized for you.**

[Our next "Go to Press Date" will be April 25th]

*For sample copies and prices please write:*

**BEVERLEY PRINTERS**

1147 EAST GRAND STREET  
ELIZABETH, N. J.

\*Time, Effort and Expense

**SPECIALISTS LABORATORY FOR ORTHODONTISTS**

**APPLIANCES**

**FIXED**

**REMOVABLE**

**TOOTH POSITIONERS**

*Scientifically made for the utmost of movement and comfort*

**STUDY MODELS**

*Beautifully finished and stamped, when requested*

**PRICE LIST ON REQUEST.**

**SPECIALISTS LABORATORY FOR ORTHODONTISTS**

**2112 Broadway, New York 23, N. Y.**

**TRafalgar 4-6800**

*For those who discriminate.*



## MORE THAN MEETS THE EYE . . .

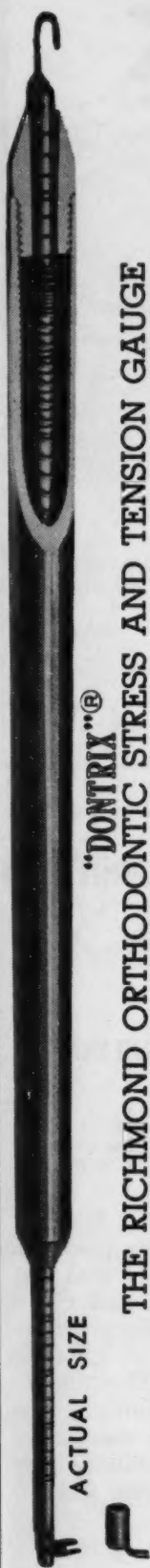


Physicians know that in every pint of blood lie vital hidden treasures.

The AMERICAN RED CROSS knows this, too. Through the Blood Program, licensed by the National Institutes of Health, it provides

- whole blood to hospitals served by the program
- blood for national emergencies
- blood derivatives to physicians and hospitals . . . serum albumin, gamma globulin, fibrinogen, fresh-frozen plasma and packed red cells
- crude fractions for research

Encourage donors to expand the availability of life's most precious fluid by giving blood wherever there are facilities for receiving it.



**"DONTRIX"®**

## THE RICHMOND ORTHODONTIC STRESS AND TENSION GAUGE

WHY a "Dontrix"? Today's advanced techniques call for "Dontrix." You have precise dimensions on your wire but varying lengths make it necessary to know their forces.

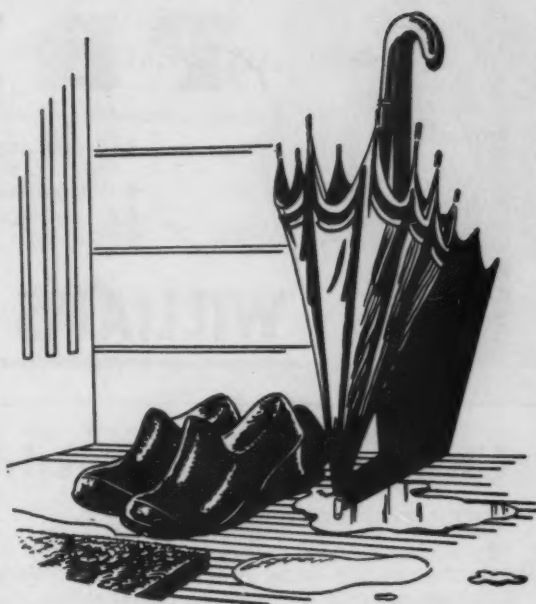
HAVE a "Dontrix" on a ten day free trial and if not completely satisfied, return (insured) and receive full purchase price. Buy from your dealer or order direct. We have never had a "Dontrix" returned.

NEW LOW PRICE, \$12.50 postpaid any place in the world (American money). Check or C.O.D. BUY TWO, one for the laboratory and one for the chair.

TEMPORARY ADDRESS:

**1800 No. Monroe**  
**Tallahassee, Florida**

**MANUFACTURED  
AND COPYRIGHTED BY  
PRECISION ENTERPRISES**



## PROTECTION!

Overshoes and umbrellas are usually adequate protection against April showers. But S-C Dental Cement provides protection against much more difficult conditions. Subjected to oral fluids combined with the terrific stress of chewing action, S-C Cement doesn't lose its grip on a dental appliance. It sticks tight, stays in place and won't let go. In addition, S-C Cement is smooth and easy to apply. It's the efficient, high-quality dental cement used by thousands of dentists everywhere.

Give your patients the security of S-C Dental Cement. Like to try it at our expense? For a free sample, all you need to do is fill out and mail the coupon (in your professional envelope, please).

## S-C CEMENT



A FREE BOOKLET that gives "The Low-Down on a High Quality Dental Cement" is available. If you would like a copy of this informative publication, check the attached coupon.

STRATFORD-COOKSON COMPANY

261-63 South 3rd Street, Phila. 6, Pa.

Please send me the following, without any charge or obligation:

☐ S-C CEMENT Sample ☐ CEMENT Booklet

Dr. \_\_\_\_\_

Address \_\_\_\_\_

OJ



## PICKLE WITH **PREVOX**

*Reg. Trademark Pat. Applied For*

- ★ Cleans precious OR non-precious metals safely, quickly, economically.
- ★ Will not tarnish or rust instruments.
- ★ No damaging or annoying fumes.
- ★ Packed in quarts or gallons.

*At All Leading Dealers*

**WILLIAMS**

**GOLD REFINING CO., INC.**  
2978 MAIN STREET, BUFFALO 14, N. Y.

## Changing Your Address?

**WHEN YOU MOVE, PLEASE—**

- (1) Notify us to change your address—allow us six weeks to make the change.
- (2) Mention the name of this Journal. (We publish twelve periodicals.)
- (3) Give us your old address. If possible, return the addressed portion of the envelope in which we sent your last copy.
- (4) Give us your new address—complete—including the Postal zone number.
- (5) Please print your name and address.

**Thank You!**

*Circulation Department, The C. V. Mosby Company, Publishers, 3207 Washington Blvd., St. Louis 3, Mo.*



## Preserve Your Journals With This *Jesse Jones* Volume File

Specially designed and produced for *American Journal of Orthodontics*, this file will keep one volume, or twelve issues, clean, orderly and readily accessible. Picture this distinctive, sturdy Volume File on your bookshelf. Its rich red and green Kivar cover looks and feels like leather, and the 16-carat gold leaf hot-embossed lettering makes it a fit companion for your finest bindings.

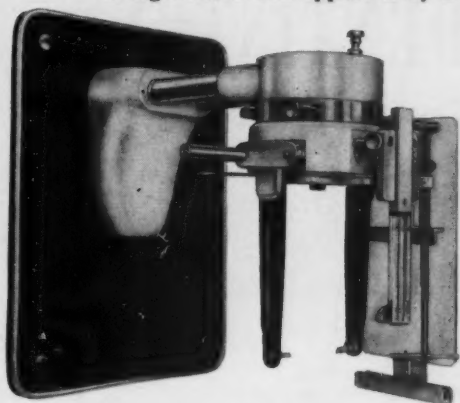
The Volume File is reasonably priced, in spite of its costly appearance. It is sent post-paid, carefully packed, for \$2.50 each. Most subscribers will find it more convenient and economical to order 3 for \$7.00 or 6 for \$13.00. When ordering specify file for *American Journal of Orthodontics*. Send check with order. *Satisfaction guaranteed.* Can be sent to U.S. and Possessions only. For prompt shipment, order direct from

***Jesse Jones & Hauck Box Corps.*** (Since 1843)

FOURTH AND THOMPSON STREETS, PHILADELPHIA 22, PENN.

# *The Wehmer Cephalometer*

Design tested and approved by a leading cephalometric research laboratory



- 1 Easy to install
- 2 Light weight
- 3 Fits any office layout
- 4 Ease of operation

The Wehmer cephalometer meets the exacting requirements of research and the convenience of the private office. Its superior design incorporates the prescribed standards of cephalometric roentgenography with new and outstanding features not present in other moderately priced equipment.

Visit our booth at the Convention in New York City and see our complete line of cephalometric accessories and installation designs.

*Illustrated brochure available on request*

**B. F. WEHMER X-RAY SPECIALTIES**

7 IMPERIAL STREET  
PARK RIDGE, ILLINOIS

## *European Convention Tours*

Brussels Meeting of Federation Dentaire Internationale departs July 26th or August 1st by Ship or Air. Two itineraries: # 1 visiting Ireland, England and Scandanavian Countries, and # 2 visiting Central Europe. Best available hotels and services of American Express Company.

An independent itinerary will be supplied any who may wish to attend the ORTHODONTIC ASSOCIATION meeting in Copenhagen, July 2-7.

*Write at once for information:*

**C. W. CARRICK**

Travel Consultant for U.S.A. Section

OBERLIN, OHIO

A SYMPOSIUM  
ON  
**PREVENTIVE DENTISTRY**

WITH SPECIFIC EMPHASIS ON DENTAL  
CARIES AND PERIODONTAL DISEASES

*Edited By*

JOSEPH C. MUHLER, D.D.S., Ph.D., Associate Professor,  
School of Dentistry and Department of Chemistry,  
Indiana University, Bloomington, Indiana

and

MAYNARD K. HINE, D.D.S., M.S., Dean, School of  
Dentistry, Indiana University, Indianapolis, Indiana.

1956, 266 Pages, 5½" x 8½", Price, \$6.75

**CONTRIBUTORS**

J. WILLIAM ADAMS  
FRANK E. BEUBE  
BASIL G. BIBBY  
PHILIP E. BLACKERBY, JR.  
DREXELL A. BOYD  
H. TRENDLEY DEAN  
L. S. FOSDICK  
IRVING GLICKMAN  
MAYNARD K. HINE  
C. L. HOWELL  
CARL A. HOPPERT  
HARRISON R. HUNT  
PHILIP JAY  
PAUL C. KITCHIN  
S. WAH LEUNG  
CYRIL D. MARSHALL-DAY  
RALPH E. McDONALD  
DAVID F. MITCHELL  
JOSEPH C. MUHLER  
FRANK J. ORLAND  
HAMILTON B. G. ROBINSON  
SAMUEL ROSEN  
A. L. RUSSELL  
JAMES H. SHAW  
ROBERT M. STEPHAN  
JOSEPH F. VOLKER  
NED B. WILLIAMS

In dentistry preventive procedures still leave much to be desired. The concept of the importance of early diagnosis and proper treatment as a method of preventing the extension of disease is now well established, and there is more attention being given to rehabilitation of the oral structures of the patient. It is still true, however, that most of the dentist's time and energy are spent on the treatment of diseases and in improving technics for treatment of disease. These are important, of course, but it is hoped that emphasis will continue to increase on studies designed to prevent the initiation and extension of oral disease and the maintenance of oral health. This book is a summarization of current thinking on the subject of preventive dentistry as developed at the symposium held at the School of Dentistry, Indiana University.

*Order today from*

**THE C. V. MOSBY CO.**

**3207 Washington Blvd.  
St. Louis 3, Mo.**

Date \_\_\_\_\_

**THE C. V. MOSBY COMPANY**

3207 Washington Blvd., St. Louis 3, Missouri

Gentlemen: Please send me on 10-day approval a copy of Muhler-Hine "A SYMPOSIUM ON PREVENTIVE DENTISTRY," priced at \$6.75. I understand that if I am not completely satisfied I can return the book within 10 days and my account will be completely refunded.

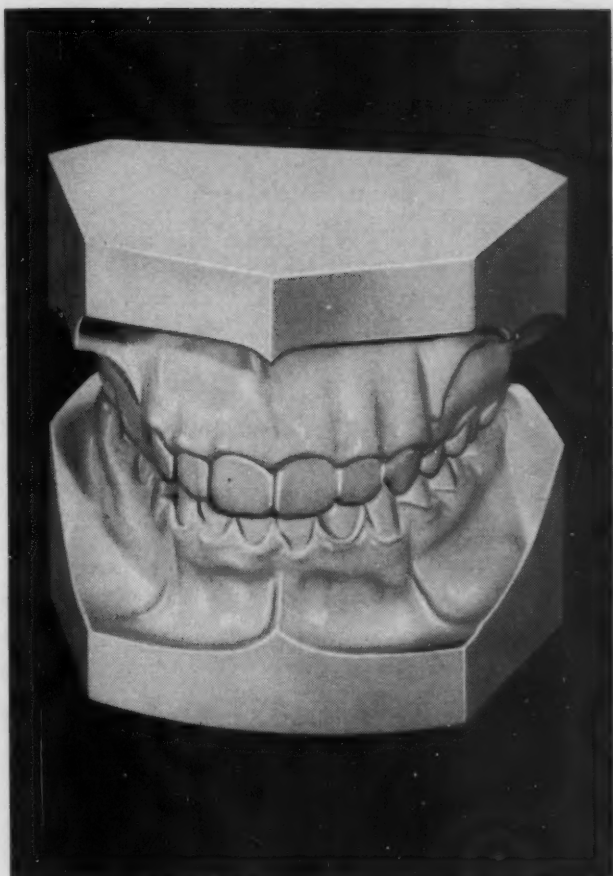
☐ Payment enclosed. ☐ Charge my account.

Dr. \_\_\_\_\_

Street \_\_\_\_\_

City \_\_\_\_\_ Zone \_\_\_\_ State \_\_\_\_

ORTHO-4-58



FOR THE ORTHODONTIST AND THE  
GENERAL PRACTITIONER WHO CARES.  
STUDY MODELS OF PERFECTION  
ARTISTICALLY HAND SCULPTURED,  
HAND POLISHED AND PRINTED TO  
YOUR SPECIFICATIONS.

WE WILL BE AT BOOTH #11  
AT THE APRIL MEETING IN N. Y.

## *The Cettel Studios*

2067 BROADWAY  
NEW YORK 23, N. Y.  
TRAFALGAR 7-4925

---

COAST-TO-COAST-SERVICE

*Information available upon request.*

## **For Directed and Controlled Force the proven, widely accepted *Steiner Headgear***

1. Direction of force varied by simple adjustments.
2. Amount of force varied as desired by selection of standard types of ligatures.
3. Maximum patient cooperation assured because of ease of application and use.
4. Can be used repeatedly by sterilization of button mechanism, and replacement of ribbon assembly at a very nominal cost.
5. Precision workmanship guaranteed.

*Brochure and price information on request*

**SPECIALIZING IN RETAINING  
APPLIANCES AND MODELS**



## **OLYMPIC LABORATORIES**

Serving the Orthodontist exclusively for over 20 years  
995 SOUTH WESTERN AVE., LOS ANGELES 6, CALIFORNIA  
Phone: REpublic 3-1658

# The Urology of Childhood

By

**T. TWISTINGTON HIGGINS**  
O.B.E., M.B., CH.B., F.R.C.S.

Senior Surgeon, The Hospital for Sick Children, Great Ormond Street; Formerly Surgeon, The Royal Northern Hospital

**D. INNES WILLIAMS**  
M.D., M.CHIR., F.R.C.S.

Surgeon, St. Peter's and St. Paul's Hospitals; Genito-Urinary Surgeon, Whipps Cross Hospital; Urological Registrar, The Hospital for Sick Children, Great Ormond Street; Leverhulme Research Scholar, Royal College of Surgeons

and

**D. F. ELLISON NASH**  
F.R.C.S.

Assistant Surgeon, St. Bartholomew's Hospital; Surgeon, The Children's Hospital, Sydenham; Formerly Surgical Registrar, The Hospital for Sick Children, Great Ormond Street; Formerly Hunterian Professor and Arris and Gale Lecturer, Royal College of Surgeons

286 pages, with 168 illustrations  
Price, cloth, \$9.50

The C. V. MOSBY Company  
3207 Washington Blvd. St. Louis 3, Mo.

# Changing Your Address?

When you move, please—

- (1) Notify us to change your address—allow us six weeks to make the change.
- (2) Mention the name of this Journal. (We publish twelve periodicals.)
- (3) Give us your old address. If possible, return the addressed portion of the envelope in which we sent your last copy.
- (4) Give us your new address—complete—including the Postal zone number.
- (5) Please print your name and address.

**Thank You!**

Circulation Department, The C. V. Mosby Company, Publishers, 3207 Washington Blvd., St. Louis 3, Mo.

# INDEX TO ADVERTISERS

Please mention "American Journal of Orthodontics" when writing to our advertisers—it identifies you

Aderer, Inc., Julius .....	17	Olympic Laboratories .....	27
American Cancer Society .....	20	Orthoband Company, Inc. ....	18
American Red Cross .....	22	Precision Enterprises .....	23
Betta Orthodontic Supplies .....	3, 5	Rocky Mountain Metal Products	8, 9, 16
Beverley Printers .....	21	Specialists Laboratory for Orthodontists .....	21
Bi-Po Company .....	19	Stratford-Cookson Company .....	23
Bruder, Leo L. ....	19	Thrombley, Gilbert W. ....	15
Carriek Travel Bureau .....	25	T-P Laboratories, Inc. ....	6
Cettel Studios, The .....	27	United States Savings Bonds .....	14
Englehard Industries, Inc., Baker Dental Division .....	1, 13	Unitek Corporation .....	10, 11
Jones & Hauck Box Corps., Jesse .....	24	Wehmer X-Ray Specialties, B. F. ....	25
Klippert Company, The .....	7	Williams Gold Refining Company, Inc.	24

While every precaution is taken to insure accuracy, we cannot guarantee against the possibility of an occasional change or omission in the preparation of this index.





# AMERICAN JOURNAL OF ORTHODONTICS

Published by THE C. V. MOSBY COMPANY, 3207 Washington Blvd.  
St. Louis 3, U. S. A.

Entered at the Post Office at St. Louis, Mo., as Second-class Matter

---

Published Monthly. Subscriptions may begin at any time.

---

Official Publication of The American Association of Orthodontists,  
its component societies and The American Board of Orthodontics

## Editor-in-Chief

H. C. Pollock, St. Louis, Mo.

Assistant Editor—Earl E. Shepard, St. Louis, Mo.

Editor of Abstracts and Reviews—J. A. Salzmann, New York, N. Y.

## Sectional Editors

Charles R. Baker, Evanston, Ill.

Henry D. Cossitt, Toledo, Ohio

Joseph D. Eby, New York, N. Y.

William E. Flesher, Oklahoma City, Okla.

Henry F. Hoffman, Boulder, Colo.

Raymond C. Sheridan, South Orange, N. J.

James D. McCoy, Beverly Hills, Calif.

Oren A. Oliver, Nashville, Tenn.

---

## EDITORIAL COMMUNICATIONS

**Original Communications.**—Manuscripts for publication and correspondence relating to them should be sent to Dr. H. C. Pollock, 8015 Maryland Ave., St. Louis 5, Mo., U. S. A.

**Manuscripts** should be typewritten on one side of the paper only, with double spacing and liberal margins. References should be placed at the end of the article and should include, in the order given, name of author, title, journal, volume, pages, and year; e.g., Smith, E. J.: Children's Dentistry, Am. J. Orthodontics, 34: 1-25, 1947. Illustrations accompanying manuscripts should be numbered, provided with suitable legends, and marked lightly on back with author's name. Articles accepted for publication are subject to editorial revision. Neither the editors nor the publishers accept responsibility for the views and statements of authors as published in their "Original Articles."

**Illustrations.**—A reasonable number of halftone illustrations will be reproduced free of cost to the author, but special arrangements must be made with the editor for color plates, elaborate tables or extra illustrations. Copy for zinc cuts (such as pen drawings and charts) should be drawn and lettered only in India ink, or black typewriter ribbon (when the typewriter is used). Only glossy photographic prints should be supplied for halftone work; original drawings, not photographs of them, should accompany the manuscript.

**Books for Review.**—Only such books as are considered of interest and value to subscribers will be reviewed, and no published acknowledgment of books received will be made. These should be sent to Dr. J. A. Salzmann, 654 Madison Ave., New York City.

**Reprints.**—Reprints of articles must be ordered directly through the publishers, The C. V. Mosby Company, 3207 Washington Blvd., St. Louis 3, Mo., U. S. A., who will send their schedule of prices. Individual reprints of an article must be obtained through the author.

## BUSINESS COMMUNICATIONS

**Business Communications.**—All communications in regard to advertising, subscriptions, change of address, etc., should be addressed to the publishers, The C. V. Mosby Company, 3207 Washington Blvd., St. Louis 3, Mo.

**Subscription Rates.**—United States and its Possessions \$10.00, Students \$5.00; Canada, Latin-America, and Spain \$10.50, Students \$5.50; Other Countries \$11.00, Students \$6.00. Single copies, \$1.75 postpaid. Remittances for subscriptions should be made by check, draft, post office or express money order, payable to this Journal.

**Publication Order.**—The monthly issues of this Journal form one volume a year; the index is in the December issue.

**Change of Address Notice.**—Six weeks' notice is required to effect a change of address. Kindly give the exact name under which a subscription is entered, and the full form of both old and new addresses, including the post office zone number.

**Advertisements.**—Only articles of known scientific value will be given space. Forms close first of month preceding date of issue. Advertising rates and page sizes on application.

**Bound Volumes.**—Publishers' Authorized Bindery Service, 5811 West Division Street, Chicago 51, Illinois, will quote prices for binding complete volumes in permanent buckram.

# *S.S. White*

## WIRES AND BAND MATERIALS

FOR ALL  
TECHNIQUES

### NO. 61 METALBA WIRE

*Platinum color; fusing temperature 1899° F.*

Our top-grade wire and definitely outstanding. Exceptionally strong, hard, tough, has all the "kick" you want. Highly ductile. High resistance to fatigue. Does not tarnish. For all purposes, and all who use it praise it.

### GOLD PLATINUM ORTHO WIRE

*Gold color; fusing temperature 1733° F.*

Used by men renowned in orthodontics for more than forty years. A highly temperable wire with strength to spare for all orthodontic purposes. Another S. S. White wire you will like.

### NO. 12 CLASP WIRE

*Platinum-gold color; fusing temperature 1798° F.*

If price is a factor in selection, do not fail to buy No. 12 Clasp. It is moderately priced, yet its physical properties are surprisingly close to those of the top-grade wires and place it definitely above the wires in its price group. It is tough, strong, temperable, with fatigue strength comparable to the best grade wires. For all orthodontic purposes.

### BAND MATERIAL C

*Gold color; fusing temperature 1825° F.*

Popular for more than three decades among men employing the lingual arch techniques. It is temperable, works nicely; is strong with excellent edge strength.

### METALBA BAND MATERIAL

*Platinum color; fusing temperature 2470° F.*

This band material cannot be praised too highly. It works beautifully—may be considered soft—and is indestructible in ordinary gas and air blowpipe flames. You cannot melt it, or discolor it in the flame or in the acids to which it will be subjected in normal orthodontic use. It is tough, strong; is in the low priced field, yet definitely above its price group.

If your dealer does not carry all S. S. White Orthodontic items you need, send your order to us with his name. Order cards, catalogs, and price lists will be mailed upon request.

THE S.S.WHITE DENTAL MFG. CO., PHILADELPHIA 5, PA.